The Iron Age

A Review of the Hardware and Metal Trades.

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The Stiles & Parker Power Punching Press.

The illustration which we present herewith represents a power punching press, geared and designed for a wide range of work. Presses of this description are largely employed in almost all kinds of metal manufacturing, and punching or stamping takes the place in many cases of forging, planing, filing and drilling. The point of advantage of this press is a perfect stop motion, which leaves the punch always at the top of the stroke when the press stops. This improvement enables the press to be run at a high rate of speed, since the operator may have all the time necessary between the strokes, and yet have the press deliver a rapid blow. This automatic stop is such a contrivance by which the wheel is disconnected from the shaft at a certain point after one revolution is performed. The adjustment of the punch is another point absolutely necessary for the best work. Screws have been used, but in heavy work the strain upon the thread is too great. In the Stiles & Parker presses this is done by means of an eccentric readily adjusted, and then held in place by set screws to prevent moving. The frame of the machine is solid, and so arranged that very heavy work may be done. The slides are very long, giving a very firm bearing, and preventing the strain from getting the punch out of line. Messrs. W. L. Chase & Co., 95 and 97 Liberty street, are the agents for these presses, which are manufactured by the Stiles & Parker Press Company, of Middletown, Ct.

The Construction and Management of Roll Trains for the Manufacture of Heavy Bars, Rails and Girders.

BY WILLIAM HEWITT, M. E.

PART I.—*General Remarks.*

The increasing demand for large masses of iron for building purposes, especially for the heavy armor plates which are now used largely in ship building, has recently attracted a great deal of attention from engineers and iron manufacturers to the appliances now in use for producing and handling the heavy masses required, which often exceed 15 and sometimes even 20 tons in weight.

Formerly, heavy work of this description was executed entirely by forging under the hammer; and, in fact, we might go back to the time when all work in wrought iron was executed in this way, but as it obviously required very simple apparatus, and a limited number of workmen, it was, therefore, a very slow and expensive method. When the puddling process came to supersede the older methods of refining the pig metal, the great increase of yield effected thereby demanded a more expeditious method of drawing out the bloom into the finished bar or sheet. This was effected by the rolling mill, which was invented by Mr. Henry Cort, of Gosport, England, and patented in 1784. Mr. Cort is also the inventor of the puddling process, and we are not surprised that both of these inventions should have been made by the same person and at the same time, when we consider that the one was essential to the success of the other. Indeed, the puddling process and rolling mill should be considered as one great invention, and it is material to observe that Cort, in his specification, speaks of the rollers, furnaces and separate processes, as well known. There is no claim to any of them separately; the claim is "for the reducing of the faggots of piled iron into bars, and the welding of such bars by rollers, instead of by forge hammers." (Memoir of Henry Cort, *Mechanic's Magazine*, July 15, 1859). "Mr. Cort expended a fortune of upward of $100,000 in perfecting his inventions for puddling iron and rolling it into bars and plates; he was robbed of the fruit of his inventions by the villany of officials in a high department of the government, and was ultimately left to starve by the apathy and selfishness of his ungrateful country." (*Mechanic's Magazine*, Dec. 8, 15 and 22, 1855. Paper by David Mushet).

The illustrious James Watt, writing to Dr. Black in 1784, as to the iron produced by Cort's process, said: "Though I cannot perfectly agree with you as to its goodness, yet there is much ingenuity in forming bars in that manner, which is the only part of his process which has any pretensions to novelty. * * * Mr. Cort has, as you observe, been most illiberally treated by the trade; they are ignorant brutes; but he exposed himself to it by showing them the process before it was perfect, and they seeing his ignorance of the common operations of making iron, laughed at and despised him; yet they will contrive, by some dirty evasion, to use his process, or such parts as they like, without acknowledging him in it." The mill in which Cort experimented with and perfected his inventions has become historical. It was destroyed by a flood during Cort's lifetime, but will ever be remembered as "the little mill at Fontley."

The rolling mill was at first used only for producing light merchant bar iron, and was found quite efficient for that class of work, but as the bar was only reduced in one direction, and after passing through a groove had to be returned over the top roll, then turned over so as to avoid finning in the succeeding pass, a considerable loss of time and labor was experienced, which prevented its extension to other classes of work. When it was attempted to produce very light work by this process, such as the fine wire rods which are now rolled with such celerity and precision, the loss of time was of vital consequence, and became a very serious objection, as the rapid cooling of the rod necessitated fast rolling. The labor, however, in this case, was immaterial, but when the application of the process was extended to the manufacture of rails, beams and armor plates, this became such a serious objection that other systems were sought for by which the work could be accomplished with greater celerity and less labor. A great many systems have been invented for effecting this purpose, and several have been tried, but only three of these have come into extensive use, and may be recognized as standard. These three are, the "three high mill," generally adopted in this country; the "reversing mill," which has become the common mill of England, and the "universal mill," which has been adopted with great success in France, and has met with considerable favor in other countries. As to which of these systems is the best the opinions of men justly differ, for each possesses advantages which the others do not, and it is yet to be ascertained which is the most efficient and economical. The efficiency may be determined by the ordinary methods of calculating the efficiency of machines, given by Rankine and others, but as direct experiment is more convincing and satisfactory than the conclusions of calculation, it seems to us that it would be advisable for some of our iron and steel associations to give each of these and other systems a fair trial, and so decide the question in a way that admits of no discussion. We have had trials of almost every kind of boiler and steam engine, but none at all of any kind of rolling mill that we are aware of, and we are disposed to believe that the questions connected with the construction of the class of machinery under consideration have not received sufficient attention at the hands of really competent engineers. The nature of the work to be performed is perfectly understood. It presents none but simple problems, and apparently there is no reason why any peculiar difficulties should be encountered in the construction of apparatus intended to perform a straightforward operation, involving little more than the application of considerable power. That the work to be performed is heavy, is certain. But mere weight of work will not suffice for the frequent recurrence of failures in the machinery performing it. The reason may possibly be found in the fact that iron manufacturers are not usually engineers, and the actual execution of engineering work to be done in their establishments too often devolves upon incompetent men. But the construction of rolling mill machinery has now become a specialty with many firms possessing the skill, experience and plant requisite to the production of first-class work, so that inferior workmanship and bad material is no longer an excuse for such failures.

Speaking in general terms, engines give comparatively little trouble, and we are disposed to believe that steam machinery in the iron districts possesses a uniform efficiency quite equal to that existing in other situations. Rolls are not unfrequently cracked at the necks; not often enough, however, to cause serious trouble. Housings seldom give way; they are usually the strongest part of the complete apparatus. It is in the proportions and design of spur gearing that the principal element of weakness is to be found.

The degree of perfection originally imparted to machinery is seldom regained if once lost, and wheels which, while new and when properly set to work, may suffice for the purpose to which they are put, when worn or improperly fitted may be quite incompetent to discharge their duties. Designers sometimes purposely render that portion of a machine which can be replaced with most ease the weakest. All things considered, it is perhaps best that if something must give way it should neither be a roll nor a housing. Certain parts of the mechanism, therefore, are so constructed that in the event of a cold bar finding its way between the rolls they will break. But the expedient is rude and unsatisfactory. A "shear-disc" or coupling plate answers a far better purpose.

At the present moment there is no such thing in existence as a thoroughly good treatise on rolling mill machinery. On the chemical changes wrought in smelting and puddling furnaces, on the character of ores and the mechanical properties possessed by the finished product, have apparently been concentrated all the energies of those who have made iron and steel their special study; while details of the machinery employed in the rolling mill have been passed over with very little notice. All that can be learned about the subject from books is embodied in a few desultory chapters, and certain sets of engravings which, however admirable as drawings, only represent, after all, indifferent practice. The mathematical principles which determine the best forms and proportions to be imparted to the different parts of the mechanism have been almost entirely ignored. The best literature on the subject is to be found scattered in the engineering periodicals of the day.

The general character of rolling mill machinery, although it is still far from what it ought to be, has indeed undergone a radical change during the past four or five years. The improvement is very perceptible when we recollect but such a short time ago its comparative rudeness and inefficiency, and we look forward to the time when a complete revolution will be effected in this class of machinery.

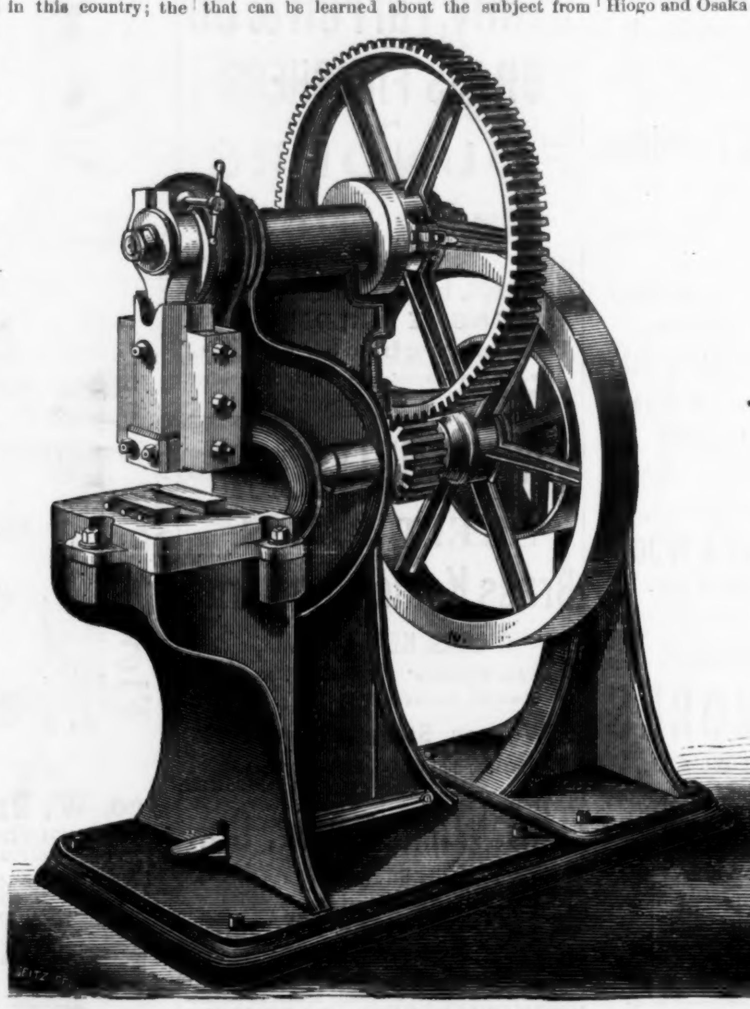
One of the recent improvements, and probably the greatest yet made in the general arrangement of rolling mills, is the application of independent and direct acting steam engines, not only to the different trains of rolls, but in many cases to the other machines, such as saws, punches and shears, and thus doing away with the great quantity of heavy gearing which was formerly employed in rolling mills for multiplying speed, and which often absorbed one-half of the whole power developed, and represented half of the capital invested in the plant of the mill.* That gearing should have been used at all, lies in the fact that until a few years back, slow moving engines of great size were alone employed to drive sheet and rail trains. These engines had a long stroke, and ran at a speed that was too slow for any but blooming rolls, so that gearing was a necessity:

"They were used to drive two, four, and sometimes six trains of rolls, and all the supplementary machines. The strains and shocks due to multiplying speed, and to the back-lash and last motion of numerous connections, induced breakdowns and heavy repairs. The whole complex establishment had to be run at a maximum speed to drive a single machine, and in case of a disaster to one part, the whole mill was stopped. In the modern system the engine shaft is coupled directly to the roll train. There, are the fewest parts, the least lost motion, and the greatest smoothness of running, and there is the highest economy of room, especially where the vertical engine is employed. When a particular train is lying still, its engine and all its connections lie still for cleansing, adjustment and lubrication.

"But this is not all. Steamship men were long enough in finding out, and rolling mill men were longer, that high speed of piston is a grand element in steam engine economy. Just as the lumbering and wasteful paddle engine of old times has given place to the compact, high speed screw engine of the present day, so has the rolling mill practice been changed. Instead of 6 foot stroke, 25 revolutions, and 300 feet per minute piston speed, we now see 5 foot stroke, 60 revolutions, and 600 feet per minute; 180 to 250 revolutions are made by the direct engines of small merchant bar trains."—(*Engineering*, April 24, 1874.)

Rolling mill engines, considered in detail, would furnish subject matter for a separate paper, and we cannot very well further refer to them without wandering from our subject.

* *Engineer*, March 26, 1869, page 223.



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Japanese Railroads.

In the report of the British Consulate for Hiogo and Osaka for 1874, dated June 16, 1875, we find the following passages: The railway from Kobe to Osaka (20¼ miles) was opened for passenger traffic on the 11th of May, 1874, so that the line has not yet been a year in operation. Parcels and goods have been carried for shorter periods, and the receipts show a steady increase, amounting by the latest published returns to about £50 per mile per week. The competition by steamers, for passengers especially, with the rail road between Kobe and Osaka is rapidly declining according as the people of the country become more sensible of the advantages of time and punctuality. The line is worked with great credit to the Japanese and all concerned, and no accident causing injury to a single passenger has occurred since it was opened. Most of the subordinate officials are Japanese. The engine drivers, but not the firemen and foreman plate layers, are foreigners. The works of the line, which include large river bridges, three short tunnels and some heavy earthwork, appear to have been constructed with care and solidity. They are reported to have withstood the action of heavy floods last year without injury or interruption of the traffic. From Osaka to Kiyoto (27 miles) the works begun last year are now in active progress, and it is believed that notwithstanding the large number of rivers to be bridged over, there is a fair prospect of the line being opened up to Kiyoto during the year 1876. With the object of connecting the port of Tsuruga on the north coast with Kobe and the Bay of Osaka, surveys have been made and the proposed line of railway marked out round the eastern side of Bima Lake from Kiyoto and Otsu to Slicotsu and Tsuruga. I am also informed that further surveys are in progress from the lake toward the interior, with the view eventually to the gaining of Kiyoto and Tokio by a central trunk line, which will open up largely tracts of country now sorely in need of improved means of communication. Traffic of Kube and Osaka line from May 11, to December 31, 1874: Number of passengers, 505,733; receipts for same, $135,440; parcels and luggage, number of parcels, 15,771; receipts for same, $3118. Goods, weight, piculs, 1981; amounts for same, $233; total receipts, $138,791. This railway was opened for passenger traffic on the 11th May, 1874, and for goods on the 1st of December, same year.

Man as Compared with the Steam Engine.—The useful effect of steam is not far from 10 per cent. of the theoretic value of the coal consumed in its production, while careful estimates fix the efficiency of the human person—which is nothing more nor less than a machine—at about 23 per cent. of the value of the food consumed. The human machine, then, is greatly superior, in its efficiency, to the steam engine, giving out more than twice the percentage of work; but it is vastly more costly. According to an elaborate estimate made by M. de Saint. Robert, recently published in the *Revue Scientifique*, of work performed by a man, it would be necessary to employ eight men to obtain one horse-power. Estimating the cost of coal at $10 per ton, and the wages of a man at the very low rate of 40 cents per day, the expense of this amount of power (one horse-power) for a day of eight hours would be about 10 cents for the steam engine and $3·20 for its equivalent of eight men.

Pacific Mail Steamship City of New York.

The new iron steamship, City of New York, built at John Roach & Son's yard, Chester, Pa., reached her pier on the morning of the 17th. Her keel was laid November 10th, 1874, and she would have been ready for service two months ago if it had not been for alterations ordered during construction. She is 353 feet long by 40½ feet wide, with a depth of 39¼ feet from the hurricane deck and 31 feet from the spar deck. Except in the designs of the forward cabin on the main deck, she is exactly like the City of San Francisco. She is of 3750 tons burden, is barque rigged, and spreads 17,000 square feet of canvas.

The City of New York left Chester Saturday, at 10 A. M., on her trial trip. She went out to sea far enough to test her machinery to the perfect satisfaction of the builder and the representatives of the owners. She steamed altogether about 500 miles. She drew 16 feet of water aft post, and 19 feet at the bow. The highest speed attained was 14½ miles per hour, and the maximum number of propeller revolutions 46 per minute. The guests were principally relatives and friends of Mr. Roach, and Mr. Faron and Mr. Rowland, together with certain gentlemen representing the Pacific Mail Company.

The City of New York was designed by Mr. Edward Faron. The joiner work by Mr. W. Rowland. She is provided with ten metallic life-boats whose aggregate carrying capacity is for three hundred and fifty persons, and with life-rafts which will carry five hundred persons. The dining saloon is most sumptuously furnished, and is 36 feet long by 40 feet wide.

The machinery proper consists of a pair of compound engines fitted with a surface condenser and six boilers, and with separate engines for working the air and circulating pumps, and also the feed and bilge pumps. The high pressure cylinder is 51 inches in diameter, and the low pressure 88, each having a stroke of five feet. This plan has the great practical value of rendering impossible any breakage of the pump gear from the "racing" of the propeller engines in heavy weather—thus insuring always the regular and easy operation of the pumps. The six boilers are cylindrical in form and measure 13¼ ft. in diameter by 10½ ft. long, tested for a working pressure of 90 lbs. per square inch. There are three furnaces in each boiler, and the amount of grate surface in all the boilers is 380 square feet, and the entire heating surface is 12,000 square feet. The propeller is of the Hirsch patent, and has a diameter of 20 feet with a pitch of 25 feet. The shaft is 120 feet long by 16 inches in diameter. The maximum performance of the engine will be 65 to 70 revolutions per minute, with a speed of vessel in good weather of fifteen to sixteen knots per hour when the machinery shall have run six months or so. In case of accident serious enough to require it, the air and circulating pumps can be used as bilge pumps to clear the ship of water. These are, in addition, the two No. 8 donkey pumps specially provided in case of leakage or fire. On the main engine there are two large bilge pumps, arranged to be connected or disconnected at will. On the pumping engines are four bilge pumps, and in addition to these the air circulating pumps can, at a moment's notice, be converted into bilge pumps also. Other bilge pumps of large capacity can be driven by the hoisting engines when it may be necessary. The aggregate power of all the pumps to free the ship of water, is 100,000 gallons, or 357 tons, per minute. There are seven bulkheads which divide the steamship into eight absolutely water-tight compartments. It will thus be understood that every possible precaution against sinking, as a consequence of collision or otherwise, has been taken.

The City of New York, City of San Francisco and City of Sydney were all built by Mr. Roach, at the price at which a Clyde builder offered to construct them for; so that if they had been foreign they could not have been cheaper—and they certainly would not have been better The Bureau Veritas, regards these three steamships as the most perfect yet built for passenger and freight business.

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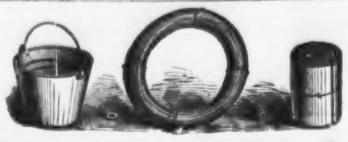

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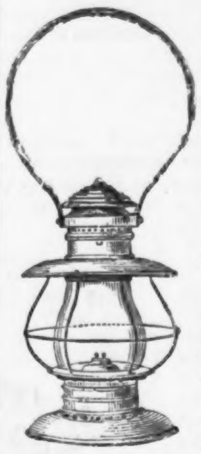

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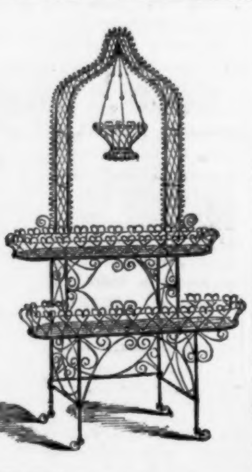

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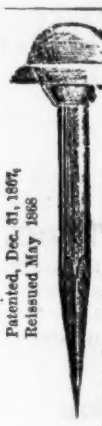

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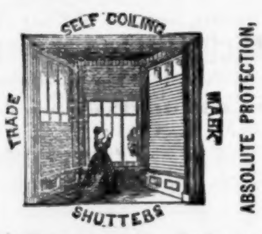

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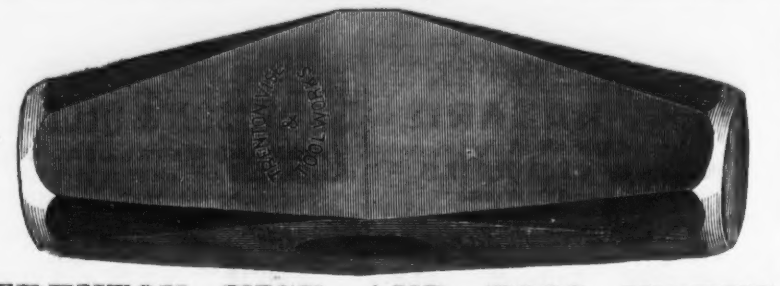

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The Spout, it will be noticed, is stamped from one piece of I x Tin, and side flanges folded ready to lock into the body of the kettle; it is then double seamed to the bottom, as the rest of the body is. It never leaks, as do all other spouts, and cannot clog with lime. We have sold immense quantities of them, and the sale grows constantly.

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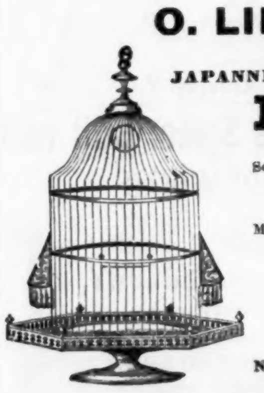

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September 3d, 1861.
October 4th, 1870.
August 29th, 1871.
November 7th, 1871.
January 2d, 1872.
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November 17th, 1874.
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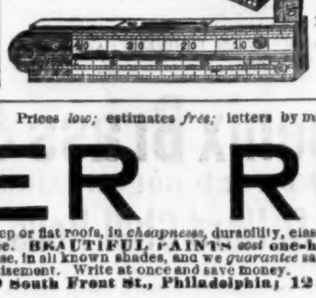

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Art Castings in Bronze.

Mr. J. M. Chase, in a paper on bronze founding, in the *American Engineer*, says:

The art of casting in bronze is of such antiquity that its origin has never been traced. It must have been practiced in the earliest historic times, as bronze castings have been found in Egypt thought to be 4000 years old, and seems to have been first confined to works of art and ornamental articles, such as statues, medals and parts of household furniture. It is an interesting fact that an analysis of the bronze castings discovered in the excavations of Nineveh, prove them to contain about the same proportions of copper and tin that are now employed in the best quality of statuary bronze.

There can be little doubt that many of the articles made by the Tyrian master, Hiram, for Solomon's temple, were cast of bronze. "For he cast two pillars of brass, of eighteen cubits high apiece." "And he made two chapiters of molten brass, to set upon the tops of the pillars." "In the plain of Jordan did the king cast them, in the clay ground between Succoth and Zarthan." 1 Kings, vii. There is here unmistakable evidence of the metal employed, as well as the materials for the molds in which they were cast. The figure of a lion found in excavations in the palace of Khorsabad proves the Assyrians to have attained a high degree of excellence in the art, and it is probable some of the bronze castings found in the ruins of Nineveh existed anterior to Solomon's temple, but it remained for those masters in the arts amongst the ancients, the Greeks, to fashion bronze in forms of transcendent beauty. Fine works of Grecian art in bronze were made as early as the 7th century B. C., but it was a much later period when the zenith in the art was attained in Greece. The colossal statue of Apollo at Rhodes, made by Chares, a pupil of Lysippus, who flourished about 290 B. C., may be mentioned as an example of the magnitude to which the ancient Greeks were able to carry their works. This bronze statue was more than 105 feet high, and was situated at the entrance of the harbor, and employed as a beacon for mariners. Like modern statues, it must have been made in several pieces and afterward fastened together. The fragments of this statue when destroyed by an earthquake 56 years after its erection, lay on the ground 923 years, when they were sold by the Saracens to a Jew of Emesa, who loaded 900 camels with them.

The Japanese were among the ancient people in Asia, who skilfully practiced the art, and they retain at the present day a reputation for admirable design and finish in their objects of bronze. The art existed among the Florentines of the 16th century, and in France in the 17th century, when the brothers Keller sent their masterpieces to Versailles; after which period it appears to have become lost, in Europe at least, and remained in obscurity until the elder Gonon, of France, began his long and laborious researches, which, with the aid of his son, have been brought to a very successful termination. Within a comparatively recent period our own country has made rapid and creditable progress in the art of bronze founding, especially in large castings, as statues, etc. In the manufacture of large bronze castings the process does not very materially differ from the ordinary method of molding. The model is lined off in sections, to facilitate the molding, and a plaster pattern is made of each section; these patterns are employed to obtain duplicates in metal. The metal sections are nicely jointed, and secured together with screws, through lugs provided for the purpose. The danger of fracture, by the shrinkage of the casting in cooling, is also an incentive to make the object in sections.

In the manufacture of the fine, delicate, and intricate works of art in bronze, those designed for parlor ornaments, etc., a totally different method of procedure from the ordinary process of molding is employed, and it is to this method that especial reference is here directed. The principal features of the operation as practiced by the Gonons, are the employment of an elastic mold for obtaining a wax model, and the subsequent molding of the wax model in prepared earth. The object to be reproduced in bronze can be sculptured directly in the wax; this is frequently done; some of the handsomest designs and most unique specimens have been made from models thus formed. But this method involves the risk of the failure to obtain a perfect casting; in which event the labor of the sculptor, which is one of the most important parts of the whole process, is also lost. When the object is to be duplicated, and hollow castings are desired, it is generally first modeled in plaster, and coated with a preparation to fill the pores. A plaster cope is made to cover the model; this cope parts in halves or more pieces as the exigencies of the case may require. The inner surface of the cope is kept a little distance from the model, and into the space thus intervening is poured compound gelatine, which possesses the property of not being affected by the air. This part of the operation requires skill and special precautions, as much of the success of the reproduction of the model with fidelity devolves upon it. When the gelatine has acquired the proper consistency, the cope is removed. The gelatine is then cut with a fine knife into as many parts as may be necessary to free it from the overlappings and indentations of the model. It is then taken from the model, which it leaves like a cloth, and placed again in the plaster cope which sustains it in its proper shape. The hollow gelatine mold thus obtained is slightly greased, and into it liquid wax is rapidly poured, which coagulates on the cold sides of the mold.

To obtain sharpness of outlines, this part of the operation requires to be conducted with the utmost celerity. More wax is afterward introduced to regulate the thickness which the casting is intended to possess. A core made of the material, of which the mold for the casting is made, and conforming to the shape of the inside of the hollow wax model which has been obtained, is placed within the model. A very little soft wax is placed on the edges of the model, so as to leave no trace of a separation between them, and the parts are then quickly put together.

The wax model, stripped of its plaster cope and gelatine mold, represents with perfect fidelity the model to be reproduced. When the wax model has been touched up and well verified, the sprues and gates, or channels through which the molten metal is to flow into the mold, and the air holes, or vents, for the exit of the gases generated by the metal, all of which are also made of wax, are posited; the channels always being arranged so as to conduct the metal to the base of the mold. The object is generally inverted in casting.

The materials for the mold are prepared earths ground very fine so as to obtain a perfect imprint. The mold is very rapidly made and placed quite wet into an oven. This mass without jointure is heated without fracture; the wax becomes liquid and runs out through a small opening provided for it, and leaving in the mold an empty space which rigorously preserves the form the wax had taken. The mold is further heated to a high temperature, not only to burn out the greasy matter which, with the wax, had penetrated the earth, but also to give to the mold the proper consistency, porosity, and other qualities necessary to contract under the action of the metal during the cooling process.

The exact proportions, and the method of the mixture of the ingredients of the mold to obtain the best results, as well as many other points in the process, are those arts of trade the secrecy of which is guarded with unfeigned jealousy by those possessing them. They are passed from generation to generation to those in the art, or may be acquired, as with the Gonons, by experimental research. The principal requisites, however, are apparent to foundry men.

Considerable skill and experience are required for the proper manipulation of the mold, the delicacy of the wax pattern imperatively precluding the ordinary method of the construction of molds for castings.

The Gonons, the famous bronze founders of France, are to be credited with the revival of this beautiful art, and with having brought it to a degree of perfection not heretofore attained. Some of their productions are marvels of the art in design and finish. At the great exposition in Paris they contributed a nest of fauvets in a branch of lilac in flower, cast in one piece, which was rewarded with a gold medal. M. Gonon has since exhibited to the "Society for the Encouragement of Art" a casting representing a nest attacked by a bird of prey at the moment when the branch on which it reposes has been broken by a storm. The details of branches, foliage, plumage, and the smallest accessories, have been made in a single casting, with all the polish of the highest finished model; and the subject just issued from the mold, and still retaining the gates and vents, showed that no retouch had been given it. The model was sculptured directly in the wax.

The Great Bells of the World.

The great bell at Moscow, called the Tsar Kolokol, or King of Bells, is the largest in the world. It is 19 feet 3 inches high, and measures around its margin 60 feet 9 inches. It is estimated to weigh 443,772 pounds, and the metal in it is valued at more than $300,000. The bells of China rank next in size to those of Russia, but are much inferior to them in form and tone. In Pekin, it is stated by Father Le Compte, there are seven bells, each weighing 120,000 pounds. One in the suburbs of the city is, according to the testimony of many travelers, the largest suspended bell in the world. It is hung near the ground, in a large pavilion, and, to ring it, a huge beam is swung against its side. A bell taken from the Dagon pagoda at Rangoon was valued at $80,000. Among the bells recently cast for the new houses of parliament, the largest weighs 14 tons. The next largest bell in England was cast in 1845 for York Minster, and weighs 27,000 pounds, and is 7 feet 7 inches in diameter. The great Tom of Oxford weighs 17,000 pounds, and the great Tom of Lincoln 12,000 pounds. The bell of St. Paul's in London is 9 feet in diameter, and weighs 11,500 pounds. One placed in the Cathedral of Paris, in 1680, weighs 38,000 pounds. One in Vienna, cast in 1711, weighs 40,000 pounds; and in Olmutz is another weighing about the same. The famous bell called Susanne of Erfurt is considered to be of the finest bell metal, containing the largest proportion of silver; its weight is about 30,000 pounds; it was cast in 1497. At Montreal, Canada, is a larger bell than any in England, weighing 29,400 pounds; it was imported in 1843 for the Notre Dame Cathedral. In the opposite tower of the cathedral is a chime of ten bells, the heaviest of which weighs 6043 pounds, and their aggregate weight is 21,800 pounds.

The manufacture of pig iron has been prosecuted in Oregon, in a small way, for some time, and efforts are being made to establish furnaces in the northern part of the State. The subject is again brought up by the prospectus of the Texada Iron Mines of British Columbia, just published. These mines are on Texada Island, in the straits of Georgia, between Vancouver Island and the mainland of British Columbia. The deposits are very extensive, about seventy per cent. iron, and are favorably situated, being surrounded by an abundance of timber and limestone.

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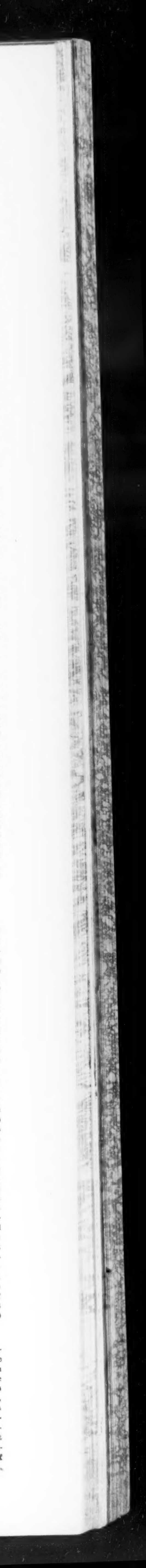

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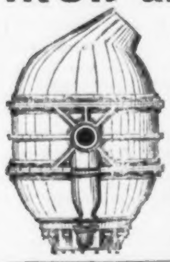

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Special Irons for Bridge and Architectural Work.

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ULSTER IRON
A full assortment of all sizes constantly on hand.
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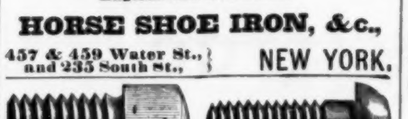

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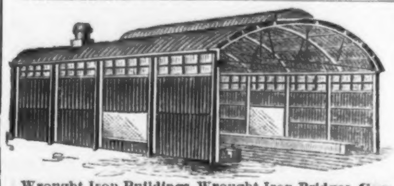

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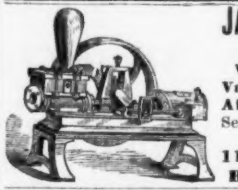

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New Patents.

We take from the records of the Patent Office in Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN FURNACES FOR THE MANUFACTURE OF IRON AND STEEL DIRECT FROM ORE.

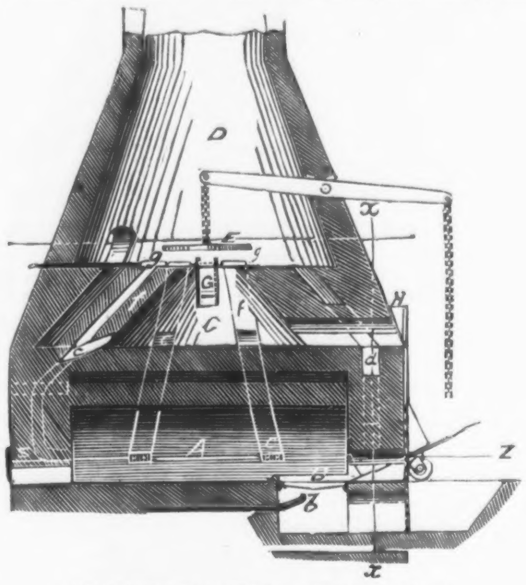
Specification forming part of Letters Patent No. 167,800, dated September 14, 1875, issued to William A. Stephens, of Succasunna Plains, N. J.

Figure 1 is a sectional elevation of furnace; Fig. 2 a vertical section on the line *x x*.

The invention consists in a furnace for the manufacture of wrought iron direct from the ore, in which a lower arched chamber, provided with a fire place, has combined with it a superposed conical chamber, in communication with the lower chamber by flues, which pass the gaseous products of combustion from the lower to the upper chamber.

The invention also consists in certain combinations, with said upper and lower chambers and furnace stack, of flues, dampers and passages, for passing the gaseous products of combustion either from the lower to the upper chamber, or from the lower chamber to the stack direct, and for otherwise controlling the action of the gaseous products; likewise for transferring the ore, after it has been roasted and deprived of sulphur and other impurities in the upper chamber, to the lower chamber of the furnace, to be puddled or worked.

A is the lower arched chamber of the furnace, and B the fire place thereof, having a blower connected with it, and of which *b* is the blast pipe. C is the superposed chamber, of conical construction, and in communication with the lower chamber by flues *c c*, through which the gaseous products of combustion pass from said lower to said superposed chamber, and whereby, and by the disposition of the two chambers relatively with each other, and by the conical and reverberatory construction of the upper chamber, the heat of the lower chamber and of the gaseous products therefrom is most thoroughly utilized to effect the treatment of the ore in the upper chamber. D is the stack of the furnace, and E a damper, adjustable over the upper open end of the conical upper chamber, to regulate or shut off communication between the latter and the stack.



IMPROVED METALLURGICAL FURNACE.—*Fig.* 1.

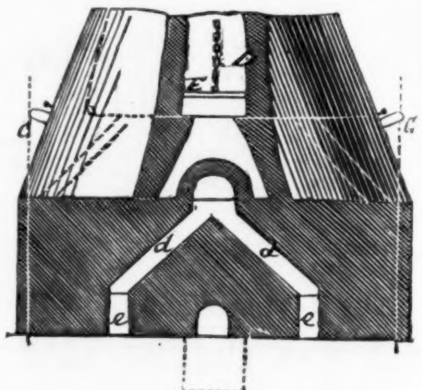


Fig. 2.

The ore is supplied to the upper chamber by a side opening down an inclined plane or chute, G; and after the ore in said chamber has been deprived of its sulphur and other objectionable impurities by the heat of the lower chamber and action of the gaseous products of combustion passing up therefrom, and acting on the ore in a reverberatory manner within the conical upper chamber, it is drawn off from the latter down passages *d d*, communicating between the doors H I of the upper and lower chambers, and with the stack, into barrows or their equivalents, by which it is transferred through openings *e* into the lower chamber A.

Connected with the flues *c c* are other flues or branches *f f*, provided with dampers *g g*, which, on being opened, establish a direct communication between the lower chamber A and the stack D; also, communication between the upper chamber C and the stack D, in addition to the communication established through the top opening in the upper chamber, controlled by the damper E. In this way or by these means the heat in or draft from both chambers may be tempered or regulated as required with the greatest nicety.

In the general operation the ore is first broken into egg size, or smaller, and two distinct charges of the same, put one in rear of the other, within the upper chamber C; and after the front charge has been sufficiently treated in said chamber it is drawn off into the low chamber, and the remaining charge drawn forward in the upper chamber, also a fresh charge introduced in rear of the one brought to the front in the upper chamber. This operation is repeated continuously, the front charges being transferred successively, one at a time, to the lower chamber C, and by the time each charge so transferred has been treated or operated on in the lower chamber the next front charge in the upper chamber is ready to be transferred. Thus the operation is continuous as regards both chambers.

The metal, after being puddled or balled in the lower chamber, may be taken to the squeezers or hammer, or be otherwise treated as in the ordinary manufacture of wrought iron.

By a furnace constructed as herein described, ore containing as much as 20 per cent. of sulphur may be made into good wrought iron without stopping the operation of the furnace, and with the greatest economy as regards fuel.

Claim.—1. The combination, in a furnace for making iron and steel, of the lower arched chamber A, the fire place B, stack D, and conical ore chamber C, superposed between the stack and the arched chamber, and communicating with the latter by passages, *c c*.

2. The combination, with the arched chamber A, fire chamber B, stack D, and conical chamber C, superposed between the stack and arched chamber, and its upper end opening into the stack, of the passages *c c*, communicating with the arched and superposed chambers, the flues *f* forming a continuation of the passages *c* and communicating with the stack, and the dampers E, *g* and *g*, for closing and opening the flues *f* and the open end of the chamber C.

3. The combination, with the upper and lower chambers A B and stack D, of the passages *d d*, communicating between the doors H I of the upper and lower chambers and with the stack, substantially as and for the purpose herein specified.

IMPROVEMENT IN FURNACES FOR MELTING METALS.

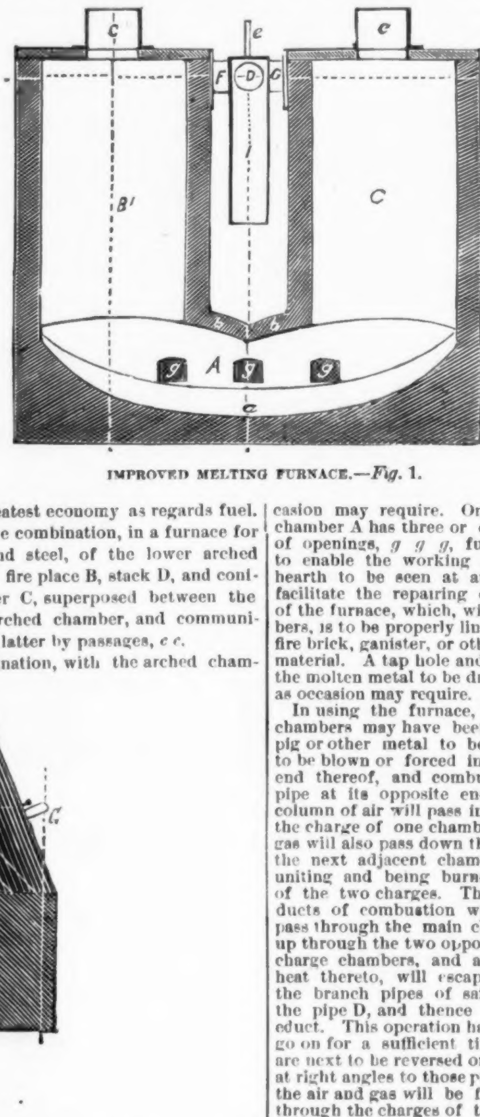
Specification forming part of Letters Patent No. 166,757, dated August 17, 1875, issued to William E. C. Eustis, of Milton, Mass.

Figure 1 is a longitudinal section, and Fig. 2 is a horizontal section, taken through the pipes for supplying air and gas to the auxiliary or charge chambers.

This furnace is to effect the melting of the metal—as iron or steel, for instance—by means of the combustion of air and gas led into it in separate columns or currents, and heated in their passage through two of the charges, and serving afterward to heat the other two charges, preparatory to their reception of separate columns or currents of air and gas to be united and burned at the bases or lower parts of such last mentioned charges.

In this furnace the charges of metal are used to heat the air and gas in the place of separate expensive chambers containing stacks or piles of bricks, and generally termed "regenerators," from which it will be seen that great advantages, both in construction, cost and expense of working, are attained by my invention.

In connection with a long chamber, A, whose hearth is shown at *a*, and crown or double arch at *b b*, there are four hollow columns or auxiliary chambers, B B′ C C′, there being a pair of them over the chamber A at and near each end of it, and to open directly into it, and over its hearth. Each auxiliary chamber is to be closed at top, except in having a hopper or induct, *c*, for supplying it with the metal, which hopper or induct may be provided with proper means of closing it, in order to prevent escape of air or gas through and from the hopper or induct. Between the two pairs of charge chambers, and at their tops, there is arranged a horizontal pipe, D, provided with four branch pipes, E F G H, leading out of it and into the four charge chambers B B′ C C′, in manner as shown in Fig. 2. An educt or chimney, I, extends from the pipe D at its middle. Furthermore, at the junctions of the pipes D and its branches E F G H are two valves or dampers, K L, which are arranged diagonally across such junctions, in manner as represented. The stems *e f* of such valves may be connected by mechanism for moving or turning them, so as to turn both valves simultaneously, as occasion may require. One side of the main chamber A has three or other suitable number of openings, *g g g*, furnished with doors, to enable the working of the metal on the hearth to be seen at any time, and also to facilitate the repairing of the main chamber of the furnace, which, with the charge chambers, is to be properly lined or protected with fire brick, ganister, or other suitable refractory material. A tap hole and spout serve to enable the molten metal to be drawn from the hearth as occasion may require.



IMPROVED MELTING FURNACE.—*Fig.* 1.

In using the furnace, after its four charge chambers may have been duly supplied with pig or other metal to be melted down, air is to be blown or forced into the pipe D at one end thereof, and combustible gas into such pipe at its opposite end, in which case the column of air will pass into and down through the charge of one chamber, and the column of gas will also pass down through the charge of the next adjacent chamber, the two currents uniting and being burned at the lower parts of the two charges. The heated volatile products of combustion will next be driven or pass through the main chamber A, and thence up through the two opposite charges or their charge chambers, and after having imparted heat thereto, will escape therefrom through the branch pipes of said chambers, and into the pipe D, and thence into the chimney or educt. This operation having been allowed to go on for a sufficient time, the two dampers are next to be reversed or turned into positions at right angles to those previous ones, whereby the air and gas will be forced into and down through the charges of the two chambers just previously heated by the spent gases. In passing through such charges, the separate currents of air and gas will absorb heat from them, and meeting together at the base of the partition between the two chambers will ignite, and aid in melting the metal, the spent gases resulting from their combustion being driven up through the other two charges so as to heat them. Thus each pair of next adjacent chambers with its metallic charges is used successively to intercept the heat from the spent gases, and transmit it to the columns of air and gas when next blown or forced through such charges.

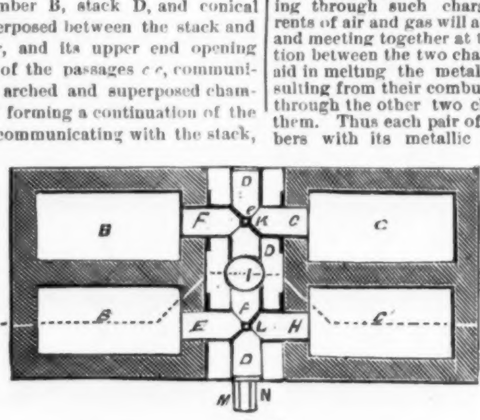


Fig. 2.

Claim.—The compound furnace, substantially as described, composed of the main chamber A, the two pairs of auxiliary chambers B B′ C C′, and the pipe D, with its branches E F G H, and two valves K L, and educt I, all arranged essentially in manner and to operate as specified.

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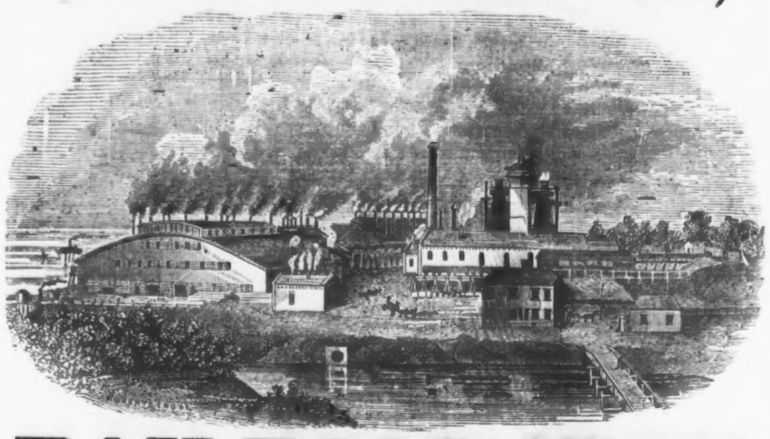
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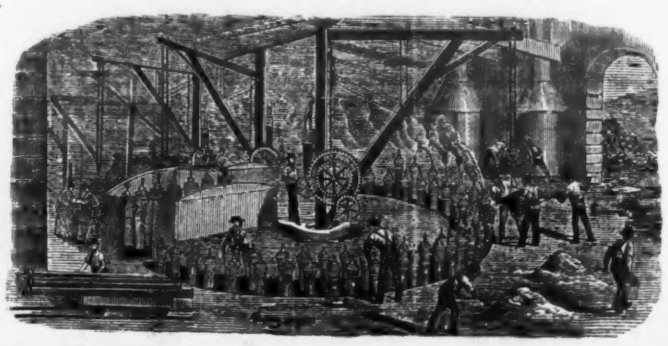
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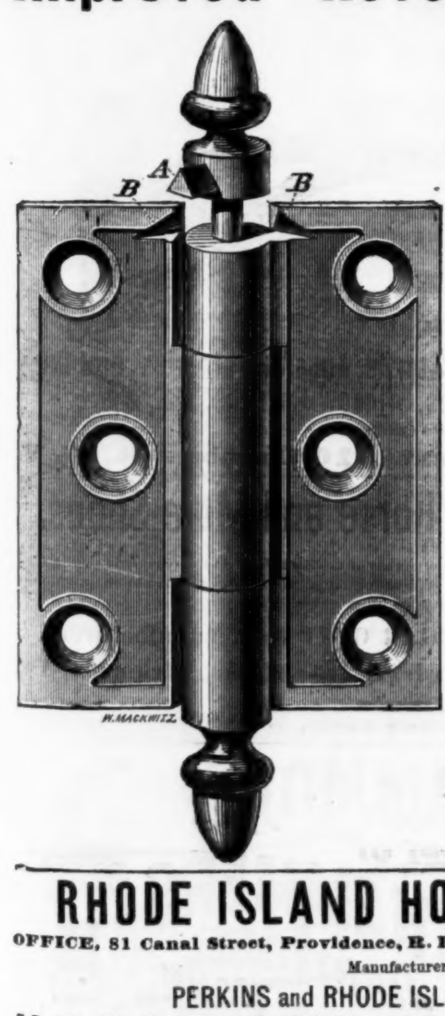

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No. V.

Strips from Bessemer and Martin plates were also cut with the shears and punch, and subjected necessarily to the tempering and annealing processes. After the latter operation the Bessemer plates could be bent to the form Fig. 32, and the Martin plates to the form Fig. 33.

Bars from both makers, the one with holes drilled, the other with punched holes, and on which the double operation of tempering and annealing had been performed, came out under the tensile test as follows:

Table No. XIII.

Resistance to rupture in tons per sq. in.

	Bessem'r Plates.	Martin Plates.
Drilled holes	30·01	26·31
Punched holes	35·94	30·30

It is probable that the annealing of these latter bars did not take place at a sufficiently high temperature to obliterate the whole of the temper obtained in the first operation.

The following conclusions may be deduced from the preceding experiments on plates from ·275 in. to ·472 in. thick.

1. That the effects of punching and shearing are entirely local and extend only over a limited zone, less than ·04 in. in width on the edge of the side sheared, or of the hole punched.

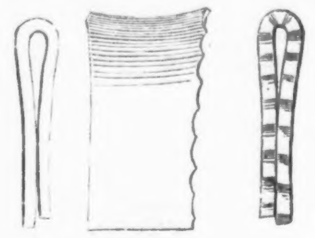

Fig. 32.

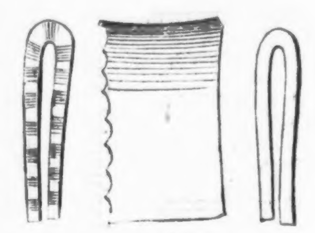

Fig. 33.

Fig. 34.

Fig. 36.

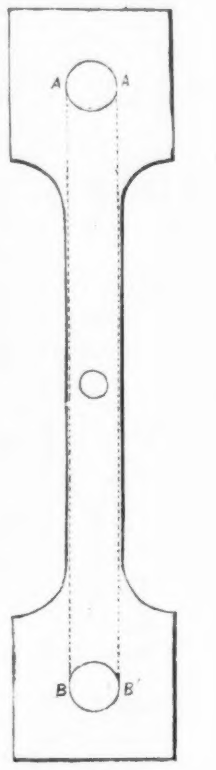

Fig. 35.

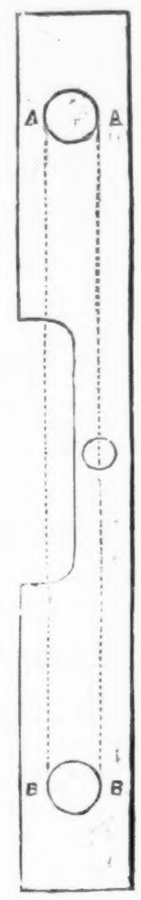

Fig. 37.

2. That no cracks exist in the parts so changed.

3. That tempering destroys the effect of shearing and of punching, by restoring the metal to the condition in which it would have been if the operations of shearing and punching had been replaced by planing and drilling.

4. That annealing by itself or after tempering, negatives, like tempering, the alteration produced by shearing and punching.

These various results are easily explained. The shearing and punching machines produce in the neighborhood of the parts subjected to their action, a local and extreme pressure. On the one hand the limit of elasticity of the metal is exceeded, and it must fail to show the original extension before rupture, but this does not explain the increase observed in the hardness and tenacity.

On the other hand, this pressure induces the solution of the combined carbon, and produces an actual tempering in the part acted on by the shears, and around the punch. These portions thus acquire greater hardness, more tenacity, and are susceptible only of slight extension. The temper thus produced is more intense than can be obtained by sudden cooling. The pressure of the punch is sufficient to exceed the limit of resistance of the metal, and this effect can never be produced by tempering mild steel of small volume, by means of simple cooling; in this latter case the pressure and the effect it produces are considerably less.

It is thus that a ring surrounding a drilled hole and tempered by sudden cooling, gave a very different result (Fig. 34) than was obtained by rings surrounding holes punched in the same plate.

Admitting this theory, account may be taken of the different facts observed, and first with reference to the influence of the width of the bars on their apparent tenacity, an influence shown in Table No. VII. Supposing that the zone of action of the punch is limited by a cylinder, the radius of which is ·04 greater than that of the punch. The different fibres of the test bar will be extended, while the tempered central part near the punched hole will extend less, and, consequently, having to carry the greater portion of the load will break, following a crack of about ·04 in. From this moment all the fibres working equally ought to show the normal resistance due to the plate, if the crack does not spread. This took place with the narrow bars 1·26 in. wide; they were held at the ends by bolts through the holes A A, B B, and about 1·2 in. in diameter (Fig. 35). The tensile strain tended to transmit itself along the tangent lines A B A' B', and the nearer the fibres approached these lines the greater was the strain upon them. It was then at the exterior that the maximum extension would take place; cracks should only be produced under an extreme load, and should show little tendency to extend. Admitting a normal resistance of 31 tons per square inch for the Bessemer plates, these test bars would break under a load of 4·459 tons, which would give an apparent resistance of 27·83 tons, that is to say, approximately the result recorded (see Table No. VII).

With conical punched holes, the metal is slightly less altered, than with cylindrical. Rings cut from around these holes have been deformed as in Fig. 36. This result is explained by the reduced tempering produced by this mode of punching; less effort is required to form a conical than a cylindrical hole in a plate. In test bars punched with such holes the extensions should be more regular, cracks would not show so quickly, and a power of resistance slightly different to that for the drilled holes would be found.

To illustrate the influence of the position of the punched hole, with reference to the tangent lines A B, A' B', bars 1·26 in. wide and of the form shown in Fig. 37, were cut out of a Bessemer plate; some of them had a drilled hole, others a punched conical hole, and in others again a cylindrical hole was punched. The center of this hole, in each case, lay in the line A' B', and the altered zone was thus in the area of greatest stress. These bars showed the resistances to rupture given in Table No. XIV.

Table No. XIV.

	Tons per square inch.
Drilled holes	29·037
Cylindrical punched holes	15·976
Conical punched holes	21·556

These results ought not to be compared with the figures previously obtained, because these bars were exposed to a bending as well as to a tensile strain; but the experiments clearly show the influence of the position of the altered zone in the test bar.

It shows also that the conical punching considerably weakens the bar, although not to so great an extent as the cylindrical punching, and that the method of testing the bars has alone prevented many experimenters from noticing this.

It is easy to explain the reduced tenacity after punching, which appears greater in bars of larger width. In these, the outer fibres, furthest removed from the punching hole, are less strained, and it is near the hole where the greatest strains take place, while, at a certain moment, the cracks produced in the altered zone extend to the ultimate rupture. It will be understood, also, that in two wide bars, though of unequal width, little difference in the resistances to rupture will be found per square inch, the cracks extending at the moment when the loads on the central parts are alike.

In bars of intermediate width results intermediate to the foregoing ought to be observed, the difference between the effects produced by the two kinds of punching becoming less and less as the width of the bar is increased.

Bars where none of these incipient cracks are produced, whether the holes have been drilled or punched and enlarged, can support a much greater load per square inch, whatever may be their width. In making experiments for tensile strain, special care should be taken as to the width and the mode of attaching the bars; these considerations are essential in order to obtain comparative results.

In practice, where the joints of plates, connected by an assemblage of rivets are frequently exposed to tensile strains, the punched plates will show decreased resistance of the same nature as the wider bars of the preceding tests, because the greatest strain will be produced in the zone surrounding each rivet.

It may be supposed that the results deduced, and above recorded, will be always reproduced in any metal in which holes have been punched, varying, of course, with the way in which the metal acts under the punch. By enlarging the hole afterward more or less with the drill the cause of alteration should be removed. In this relation experiments were made with iron plates. A preliminary trial was made to test the influence of the width of the bars on their power of resistance:

Table No. XV.

	Width of Bars. In.	Resistance in tons per sq. in.
Not punched....	·787	17·5
" ...	1·181	17·69
Conical punched hole, diameter of punch, ·67 in., diameter of die ·826 in.	1·26	16·80
	1·97	16·51
	2·68	15·19
	3·39	14·71
	4·10	14·77

A second test was made in order to prove if an enlargement of the punched hole was sufficient to restore the metal to its apparent primitive tenacity; the best bars were 2·36 in. wide:

Table No. XVI.

	Resistance to rupture in tons per sq. in.
Hole drilled out to ·748 in. diam.....	16·93
" punched to ·748 in. diam.....	14·84
" " ·668 inches, enlarged to ·748 in..	15·85
Hole punched to ·59 inches, enlarged to ·748 in.	17·18

According to these data punching exerts on iron plates effects that may be compared to those produced on steel plates; the extent of the affected zone appears rather larger, and the apparent loss according to the foregoing table would be about 12 per cent. Rings cut out around holes punched from iron plates were subjected to bending like the steel rings before mentioned. Whilst the rings from the drilled plates were susceptible of considerable deformation before rupture, those from punched holes broke before their form was appreciably changed. These latter, however, after having been annealed at a cherry-red heat, could be bent like those taken from the punched holes.

These phenomena may be explained, as in the case of steel, by a permanent alteration in the elasticity of the parts around the punched hole, and also by a solution in the iron, under the influence of the pressure, of foreign bodies, and especially of the carbon, the traces of which are always present.

It has been shown that punched and sheared plates, submitted to the influence of tempering, are relieved from the weakening influence of the punch and the shears, and behave like planed plates that have also been tempered. This fact is explained by considerations analogous to the preceding one.

The shears and the punch tempering the metal in the vicinity of the points on which they act, the bands thus affected cease to have their original homogeneity, and under a relative minimum deformation the commencement of rupture manifests itself; on the test strips cut with the shears, and the punch, the cracks are always produced on the edges, the central part presenting no trace of alteration. When, on the other hand, these bands thus affected locally are heated and tempered, the part originally tempered by the shears or the punch, is brought by means of the high temperature to the same condition as the edges; an equal quantity of carbon is dissolved throughout, the lost elasticity is restored, in short, a strip of homogeneous metal is produced, which preserves its homogeneity after tempering, and which, therefore, resists bending, as if it had been cut in the planing machine.

In the test bars submitted to tensile strain the same facts were proved, tempered punched bars supporting the same load as drilled and tempered bars. In presence of the facts just recorded, in order to preserve in contoured plates and bars of steel their normal value, the use of the punch or shears ought to be abandoned, or at least the zone affected by the use of these tools should be removed by annealing. Leaving on one side for the moment the convenience of annealing, which we shall consider later on, we see that sheared plates ought to be planed, and that holes should either be drilled or punched and afterward enlarged. Sheared plates can easily be planed, where the edges are straight or approximating to a straight line. In other cases they should be chipped. This operation is often executed on iron plates when very careful adjustment is required. Angle irons ought sometimes to be treated in the same manner, though the operation may frequently be dispensed with, the ends of angle iron rarely being called upon to play an important part.

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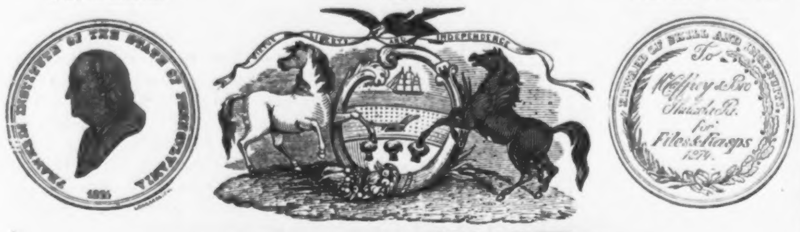

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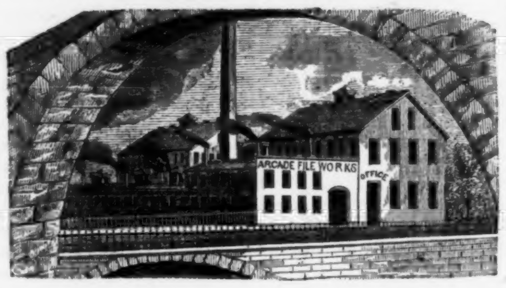

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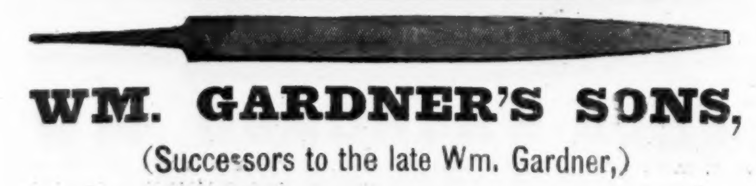

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Files,
Governors,
Bolts,

Railroad & Machinists' Supplies.

50 and 52 JOHN STREET, NEW YORK.

SEND FOR PRICE LIST.

ELIAS G. HELLER. PETER J. HELLER. GEO. E. HELLER. JOHN J. HELLER.

HELLER & BROS. T M NEWARK, N.J.

We invite the attention of the trade to our **Celebrated American Horse Rasps and Files.** These Rasps are made from the very best American Steel, all cut by hand, and we warrant them equal to any other make in the market. For the information of persons unacquainted with our goods, we will state that every File or Rasp manufactured by us, since our establishment in 1866, have been stamped "*Heller & Bros.*" though commonly called the "*Heller Rasp.*" All Rasps not stamped as annexed diagram are not genuine. We will send sample lot, if requested, and if not as represented they can be returned, or held subject to our order, free of all charges. For sale by the leading Hardware Dealers in the United States.

S.S. PUTNAM & CO FORGED HORSE NAILS

PAT. 1866.

Putnam's Government Standard

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HORSE SHOE NAILS.

Manufactured from the best of **NORWAY** Iron, and warranted to give entire satisfaction.

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MINERS AND SHIPPERS OF

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The following superior and well-known Lehigh Coals are mined by ourselves, and those connected with us, viz.

A. Pardee & Co.	HAZLETON, CRANBERRY, SUGAR LOAF
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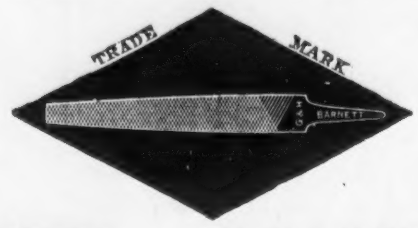
Black Diamond File Works.

Send for Illustrated Price List.



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G. & H. BARNETT, 39, 41 & 43 Richmond St. Phila.

LINFORTH, KELLOGG & CO.,

Sole Agents for the Pacific Coast, 3 & 5 Front St., San Francisco, Cal.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,

SOLE AGENTS FOR

Thomas Turner & Co.'s Suffolk Works,

SHEFFIELD.

FILES AND HORSE RASPS,

And Importers of

P. S. **STUBS' FILES, TOOLS & STEEL,**

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AUBURN FILE WORKS,

Superior Hand-Cut

FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,

89 Chambers and 71 Reade Streets, N. Y.

JOHN ROTHERY'S

Celebrated Hand-Cut FILES,

Made of Best English Cast Steel.

WALSH, COULTER & FLAGLER, Sole Agents,

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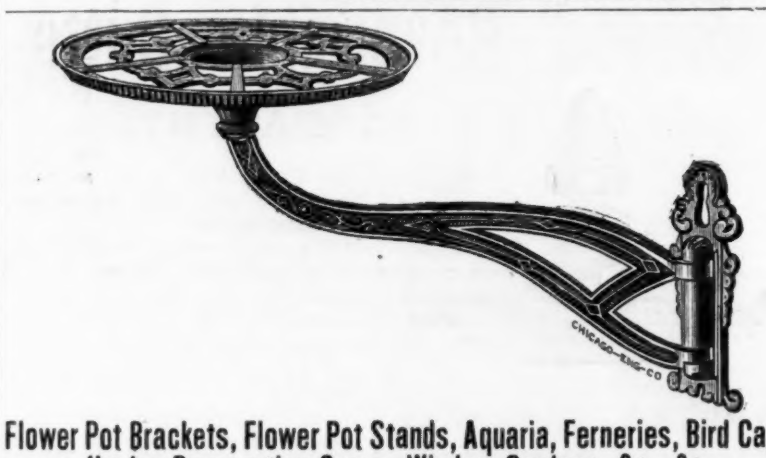


Flower Pot Brackets, Flower Pot Stands, Aquaria, Ferneries, Bird Cage Hooks, Propagating Cases, Window Gardens, &c., &c.

Send for a Catalogue.

G. WEBSTER PECK, Agent, 110 Chambers St., N. Y.

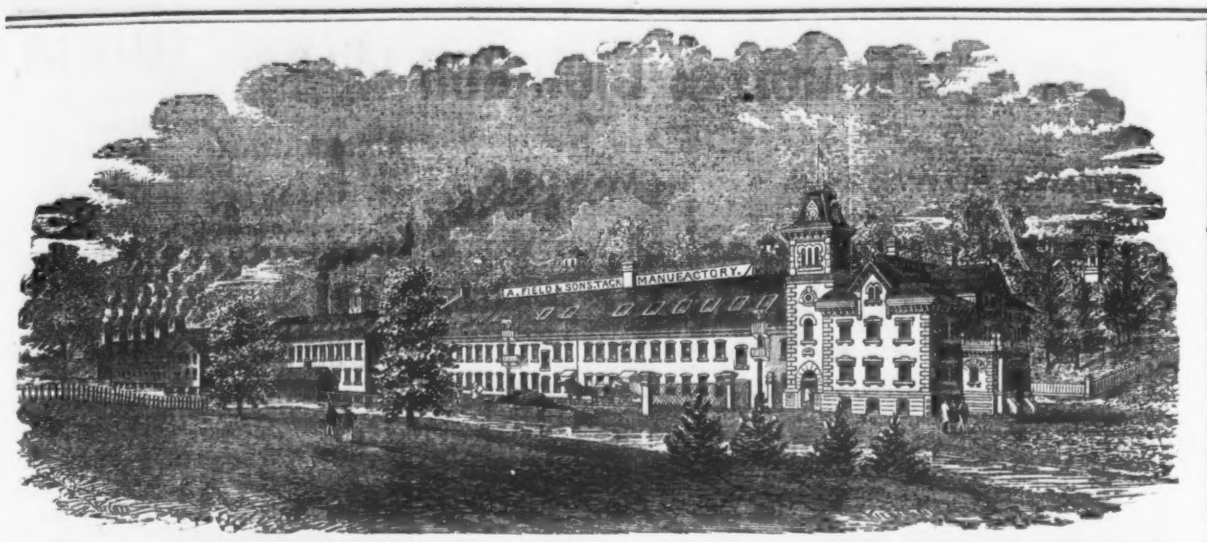
Tredegar Horse and Mule Shoes.

These superior Shoes are made of the Best Virginia Charcoal Iron. They are well adapted to Western and Southern demand, and are shipped to all prominent markets at freights as low as on other makes.

THE TREDEGAR COMPANY, Manufacturers,

Tredegar Iron Works, Richmond, Va.

SEMPLE, BIRGE & CO., Sole Western Agents, } ST. LOUIS, MO.



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COPPER & IRON TACKS, TINNED TACKS,

SUPERIOR SWEDES IRON TACKS. for Upholsterers' Use, Saddlers' Suoolv, Card Clothing, etc., etc.

American and Swedes Iron Shoe Nails,

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads. Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y.,

where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above named goods made from samples, to order.

Hopkins & Dickinson Manufacturing Co.,

FINE METAL WORKERS,

Works, Darlington, N. J. 69 Duane Street, N. Y.

Hand Made Locks and Real Bronze Hardware.

NEW AND ARTISTIC DESIGNS FOR

Private Residences, Banks, Churches and Public Buildings.

OTIS PASSENGER —AND— FREIGHT ELEVATORS

FOR HOTELS, OFFICE BUILDINGS, STORES, WAREHOUSES, FACTORIES, MINES, BLAST FURNACES, &c.

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348 Broadway, New York.

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METALS.

Anthracite Pig Irons,

COLD AND WARM BLAST CHARCOAL IRONS,

American and English Bessemer Irons, Iron Ores.

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Advances made on Merchandise.

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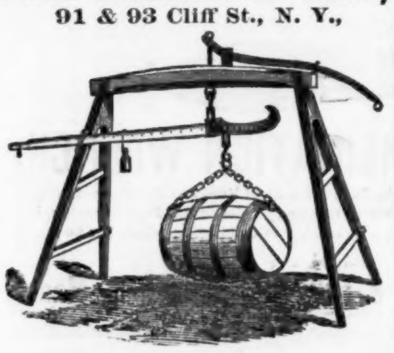

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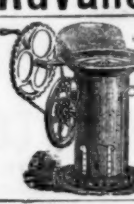


Forge without Hood.

(Patterson's Patent.)

Prepared to Supply all Orders Promptly.

Send for Prices and further information.

GEORGE PLACE, General Agent,

121 Chambers & 103 Reade Sts., N. Y.

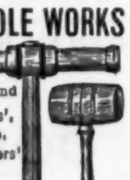
Forge with Hood.

N. Y MALLET and HANDLE WORKS

keep constantly on hand Caulkers', Carpenters', Stone Cutters', Tin, Copper & Boiler Makers'

MALLETS,

Hawsing Beetles, Hawsing and Caulking Irons, also, all kinds of Handles. Sledge, Chisel & Hammer Handles. 456 E. Houston St., N. Y.



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Automatic Lock Hinge

STEP LADDER.

The Best and Cheapest in the World.

F. F. ADAMS & CO.,

ERIE, PA.,

Manufacturers of

Pat. Wooden Articles.

We make a Specialty of

WALNUT and ASH WAINSCOTING,

STEP LADDERS,

EXTENSION LADDERS,

Clothes Horses, Rat Traps,

TOWEL ROLLERS, &c.,

AND HAVE THE

Best facilities for the manufacture of Straight and Irregular Turned Work.

The following is a partial list of the Jobbing Houses that keep our goods in stock.

Pratt & Co..............Buffalo, N. Y.	Ames Plow Co.........Boston, Mass.	Thos. Holliday & Co., Cincinnati, O.
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John H. Hill..........Rochester, "	David Landrath & Son.....Phila, Pa.	McIntosh, Good & Co., Cleveland, O.
L. L. Thurwachter.... Syracuse, "	Griffith & Page........ ... "	Bingham & Williamson, "
S. & P. Templeton.......Albany, "	Thos. Norris & Son ..Baltimore, Md.	Poe & Breed..............Toledo, O.
E. A. Burrows & Co........Troy, "	J. Seth Hopkins & Co., "	Ketcham & Volt. .... "
Hopping Bros. & Osburn, New York.	Lindsay, Sterrett & Co., Pittsb'h. Pa.	Jno. H. Thomas & Co., Louisv'le, Ky.
J. H. Knapp & Co........ "	Buhl, Ducharme & Co. Detroit, Mich.	Morrison Bros. & Co., Hamilton, Ont

HOISTING Machinery

Mfd. by CRANE BROS. MFG. CO., Chicago.

BUSINESS ITEMS.

NEW YORK.

It is announced that Charles Morgan, of New York, has concluded a contract with the Harlan & Hollingsworth Company, of Wilmington, Del., for the immediate construction of two iron propeller steamships for his line between New York and Brashear City, Texas. They will be similar in size and model to the two just built for that line by the same builders, being about 2000 tons capacity each.

PENNSYLVANIA.

Lemont Furnace, near Uniontown, will be ready to blow in as soon as one engine has been completed and put in place. The dimensions of this furnace are 65x15 feet. The hoisting house is frame, 28x12 feet, 80 feet high; the casting house is brick, 72x44 feet, 24 feet high, with corrugated iron roof, which rests upon iron trusses; engine house, brick, 28x40 feet, 26 feet high. The engines will have 36 inch cylinders, 4 feet stroke. Blowing cylinder, 6 feet diameter, 4 feet stroke. The ovens, two in number, are of the Player patent.

The iron works at Knauerstown, Chester county, use coke for fuel, which is taken to Pottstown from Pittsburgh in cars, and thence conveyed by wagons to the works.

A fire at Johnson, Black & Co.'s stove works, Erie, lately destroyed the japannery department. Loss, $20,000; uninsured.

Bradley, Reis & Co., Newcastle, have an order for 100 tons of galvanized iron, to be used in manufacturing the cornice of the Centennial buildings at Philadelphia.

The Allentown Iron Company at present have a good demand for pig iron of their manufacture. They have for some time past been shipping an average of 1500 tons weekly.

They are now making bright tin at the United States Tin Plate Works, at McKeesport.

The Edgar Thomson Steel Works, at Pittsburgh, made one day recently 84 tons of ingots.

Three thousand two hundred and ninety tons of pig iron have recently been sent to the Pennsylvania Steel Company at Harrisburgh from the Neshannock Furnace in New Castle.

MASSACHUSETTS.

The tempering and hatchet shops of the Douglass Axe Factory Co., at East Douglass, were destroyed by fire recently. Loss, $35,000; partially covered by insurance.

The Springfield *Union* says: The Wason Car Co.'s dull season seems to be about over, and it will increase its present force of upward of 100 workmen to about 300, November 1. It has hopes of receiving subsequent orders enough to work a force of 450 workmen during the winter.

OHIO.

The Youngstown Rolling Mill Company, the Girard Rolling Mill Company, the Falcon Iron and Nail Works, and Mr. L. B. Ward, of Niles, have associated themselves and formed the Mahoning Iron Company, and are about erecting a warehouse, from which they propose selling the products of their mills and carrying on a general iron business.

The Riverside Boiler Works, at Columbus, is doing a very fair business. This company is just about to remove to new shops, where they will have facilities for manufacturing equivalent to the demand upon them. They have lately been putting into public institutions at Columbus and elsewhere some large tubular and other boilers.

The Cleveland Rolling Mill Company is running double turn in every department excepting the plate mill.

The Buckeye Agricultural Works, Springfield, are putting in a new engine and boiler of increased power.

The Cleveland Iron Company is running on an order for 4000 tons of iron rails, for the Scioto Valley Railroad.

The Brown Manufacturing Company's works, at Zanesville, are running full, employing at present about 100 hands. Their principal manufactures are wagons and plows.

The Canton Wrought Iron Bridge Company have contracts ahead aggregating $300,000. Their works are being run 14 hours per day.

Marchand & Morgan, Alliance, manufacturers of steam trip hammers, have recently turned out and shipped to Messrs. Lewis, Oliver & Phillips, Pittsburgh, a five hundred pound double stand hammer, also a one thousand pound steel hammer for Hussey, Wells & Co., Pittsburgh. They are now building a two ton hammer for the Globe Rolling Mill Co., of Cincinnati.

The Massillon Excelsior Works are enlarging their capacity about one-third.

The Cuyahoga Works are building a hoisting apparatus for the Cleveland Rolling Mill Company to be placed on the Lake Superior mining lands, at Saganaee. They are also turning the large shaft for the Akron Flouring Mill, forged by the Lake Erie Iron Company. The shaft is sixteen inches in diameter and twenty-three feet in length.

NEVADA.

The hoisting works of the Utah mine, in Virginia City, were destroyed by fire Oct. 10th. The loss is a quarter of a million. The works were recently completed with machinery to sink a shaft to the depth of 2000 feet. The engineer stood at his post hoisting out the miners until he was badly burned. Four men, who remained below when the engine was abandoned, escaped through an old shaft.

CALIFORNIA.

The Pacific Saw Manufacturing Company, of 17 and 19 Fremont street, San Francisco, have recently been making a number of additions to their machinery, thereby enabling them to turn out work with greater dispatch and to make many new articles. At the Australian Exposition of 1875 this company carried off all the prizes, and received a large number of orders. They have also forwarded a full assortment for exhibition at the Chili Exposition. Their trade extends to Oregon, Washington Territory, California, Arizona, Mexico, Central and South America, and they frequently receive orders from the Eastern States.

A New Telegraph System.

A new telegraphic system, invented by Paul la Cour, vice-president of the Royal Meteorological Institute at Copenhagen, obtained considerable attention lately at the International Telegraphic Congress at St. Petersburg, where the inventor exhibited it. The invention is thus described by the inventor: The system does not consist in a new form of receiving and transmitting aparatus, which by the talented combination of Huges, Wheatstone, Siemens and others have attained such a state of perfection that great improvements seem improbable. La Cour's system, however, opens up a new scope for telegraphy in that he has constructed some simple instrument, whereby the electric current, by being passed through different instruments obtains different qualities, whereby it can act upon corresponding instruments at the receiving station. Supposing twenty conducting wires be led from one of the poles of a battery through twenty such instruments, then by connecting each or some of these with a single telegraphic wire the following result is obtained, viz., that an electric local current is produced in the twenty corresponding conducting wires on the receiving station, exactly as if the twenty conducting wires on the transmitting station were connected with the twenty conducting wires on the receiving station, by means of twenty separate telegraphic wires, while there is in reality one single telegraphic wire only. La Cour's instruments consequently accomplish the same as if the number of telegraphic wires were the same as the number of instruments; they are very simple, and their construction is as follows: Each of these little instruments contains a tuning fork which is so connected with an electro-magnet and two wire coils, that the electric current by traversing the instrument becomes isochronously vibrating in the "measures" which corresponds with the note of the tuning fork, and when a thus vibrating current then traverses similar instruments on the receiving station, then those tuning forks in them which have the same note as those in the transmitting instruments will be set vibrating, and thus a current is caused in their local wires. It is evident that such a multiplication of a telegraph line can be very advantageously applied in many ways. As each pair of instruments applied at the two termini of the telegraph line represent the application of a new line, a new pair of telegraphic clerks can be applied to correspond with one another without disturbing the correspondence going on along the same line, and the correspondence can thus be considerably multiplied. Instruments at intermediate places can also be applied, and thus many different telegrams can be sent simultaneously to different stations. This system is also suitable for transmission of handwritings or drawings—pantelegraphy. Heretofore this has been done by the synchronous movement many times over the paper of a single line on the transmitting and receiving station, but in La Cour's system a great number of lines may be moved over the paper side by side, and the handwriting is produced by one passage over the paper. The vibrating currents in this system have also the advantage that they do not affect other ordinary relays or receiving instruments through their pass, so that they can pass through a line without disturbing the correspondence going on, neither do the ordinary currents from the other end affect La Cour's receiving instruments. These vibrating currents thus neither disturb the ordinary telegraphing through the line nor are they disturbed by it.

Report of Inspections made by the Hartford Steam Boiler Inspection and Insurance Company for the months of June, July and August, 1875.—During the three months ending Sept. 1, 4814 visits of inspection were made and 9410 boilers examined. Of these 3147 were examined internally and thoroughly, and 8830 were inspected externally. The hydraulic pump was used in 575 instances, mostly in connection with new boilers. The defects will be found to be quite numerous and some of them were close upon the verge of danger. They were in all 5376, of which 1514 rendered the boilers liable to accident any hour. These defects were in detail as follows: Furnaces out of shape, 256—44 dangerous; fractures, 388—200 dangerous; burned plates, 303—119 dangerous; blistered plates, 891—173 dangerous; sediment and deposit, 731—162 dangerous; incrustation and scale, 713—127 dangerous; external corrosion, 361—131 dangerous; internal corrosion, 184—58 dangerous; internal grooving, 30—12 dangerous; water gauges defective, 203—57 dangerous; blow out defective, 72—33 dangerous; safety valves overloaded, 157—81 dangerous; pressure gauges defective, 622—159 dangerous; boilers without gauges, 210—8 dangerous; deficiency of water, 25—14 dangerous; braces and stays broken, 220—136 dangerous; boilers condemned, 64. The record of details is very much the same as in previous reports. It is an old story. During these months we have recorded 24 boiler explosions, killing 41 persons and wounding 44.

An apparatus for washing smoke, and so depriving it of its character of a nuisance, is in operation at a factory at Menilmontant, Paris. A fine shower of water, traveling in the direction of the smoke, and at five times its velocity, is projected into the chimney, where it mixes with the smoke, taking up the soluble gases and precipitating the impurities carried up with the smoke by the draught. The foul water is discharged into a cistern, where it is collected and a fine black paint is got from it.

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS. TOOLS FOR BRAZING, &c.

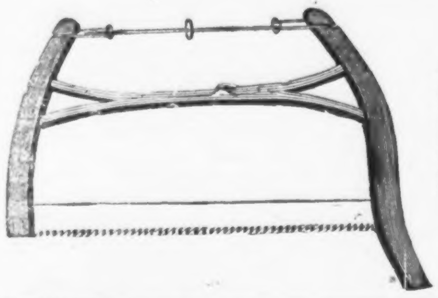
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

H. W. PEACE,

MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.



Elliptic Forked Saw Frame.

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
Sole Proprietor & Manufacturer,
VULCAN SAW WORKS.
WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

THE SILVER STEEL

DIAMOND CROSS-CUT SAW.

$1.50 Per Foot. **Patent Secured**

PATENT HANDLES AND GAUGE INCLUDED.

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by E. C. ATKINS & CO., Indianapolis, Ind., who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

E. C. ATKINS. H. KNIPPENBERG.

E. C. ATKINS & CO.
Saw Manufacturers and Repairers, Indianapolis, Ind.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.
Stearn's Hollow Augers and Saw Vises
Bonney's Spoke Trimmers
Double Edge Spoke Shaves
Adjustable Gate Hinges
Scandinavian Pad Locks
Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

WILLIAM A. DODGE,

Commission Hardware,

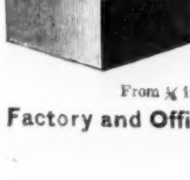
96 Chambers Street, New York City,

AGENT FOR

American File Co.'s Files.
J. M. King & Co.'s Stocks and Dies.
Blake Bros.' Butts, Pullies, &c.
Greenfield Tool Co.'s Planes.
M. S. Brooks' Screw Eyes, Hooks, &c.
Watson & Co.'s Cotton, Wool & Horse Cards.
Thrall's Try Squares, Bevels and Rules.
J. P. Verree's Hammers and Edge Tools.
Judd & Blakeslee's Snaps, Sash Fasts, &c.
H. Wilkinson's Mincers and Screw Drivers.
Bits & Co.'s Hand and Bench Screws.
T. T. Rhodes' Saw Handles.

American Screw Co.'s Rivets and Screws.
Stillman's Saw Sets.
Dodge's Kentucky Cow Bells.
Holroyd & Co.'s Stocks and Dies.
C. S. Griswold, Augers and Bitts.
Romer & Co., Pad Locks.
Wm. Cleveland, Star Faucets.
Bullock's Babbitt Metal.
Cowles' Hardware Co. Mincers, &c.
Robbins' Cotton Lines.
Amidons' Braces.

NEW HAVEN NUT CO.,



MANUFACTURERS OF

HOT PRESSED NUTS

Of Superior Quality of all sizes, both

HEXAGON & SQUARE,

From ¼ inch to and including 1½ inch Bolt.

Factory and Office. - - - - - - WESTVILLE, CONN.

Wheeler, Madden & Clemson

MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS, Etc., Etc.

E. M. Boynton,

80 Beekman Street,

NEW YORK,

Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old V, outlined on M tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

TO HENRY DISSTON & SONS:

Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?

make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

J. FLINT,

Manufacturer of

ALL KINDS OF

SAWS

And Plastering Trowels,

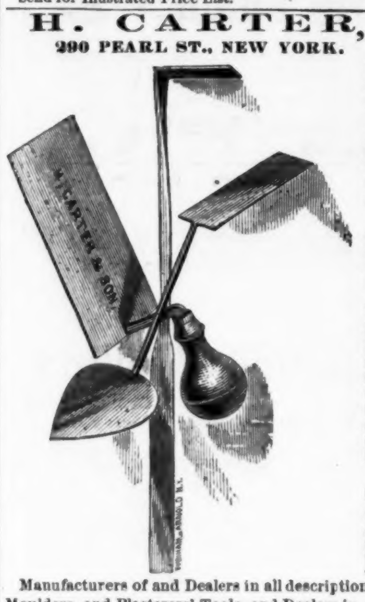
ROCHESTER, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market.

Send for Illustrated Price List.

H. CARTER,

290 PEARL ST., NEW YORK.



Moulders' and Plasterers' Tools.

Manufacturers of and Dealers in all descriptions of Moulders and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes.

CARTERS' PATENT CARRIAGE LIFTING JACK, &c,

GEO. M. EDDY & CO.,

Manufacturers of **Measuring Tapes**,
353 Classon Avenue, Brooklyn, N. Y.

Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the same trades, Lumbermen, Machinists, Tailors, Shoemakers, Dressmakers &c. Catalogues on application.

VAN WART, SON & CO.

Hardware Commission Merchants,

EXPORTERS AND IMPORTERS,

BIRMINGHAM, - ENGLAND,

Agents,

VAN WART & McCOY,

134 & 136 Duane Street, N. Y.

George H. Gray & Danforth,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

W. Clark's Genuine Horse Clippers.

Seydel's "Ashantee" Pocket Hammock

OSCAR IRVING VAN WART & Co.,

FORWARDING AGENTS,

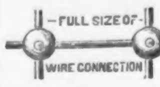
2 South John Street, LIVERPOOL.

JOHN MAXHEIMER,

Patented,

June 3, 1862; April 6, 1869; Dec 23, 1873; Jan. 20, 1874; Dec. 22, 1874.

Manufacturer of



JAPANNED and PATENT EUREKA

Bright Metal

BIRD CAGES.

Nos. 247 & 249 Pearl Street
NEW YORK.

LE COUNT'S

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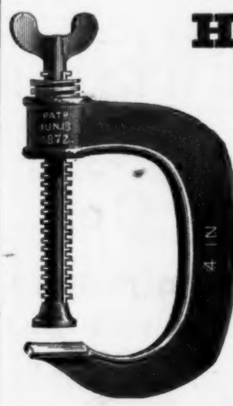

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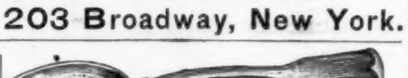

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The demand for **Joseph Rodgers & Sons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam Power.

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AMERICAN PEN AND POCKET KNIVES,

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My Blades are forged from the best Cast Steel and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass Mechanics' Ass'n Sept., 1869.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Oct. 18, 1875.

As is usual with election weeks, the past has been almost given up to the discussion of politics, and the salvation or destruction of the best interests of the country by the success or failure of either party. The result of the election in Ohio is said to have strengthened the confidence of business men very much—to have removed their fears of any disarrangement of the finances in the near future, and to have increased their hopes for the speedy return of prosperity to the country. The trade of the autumn, while conservative, has been good, and what is better, has been very generally paid for. The money articles report a good and increasing demand for money in exchange for business paper, always a healthy sign, and a considerable movement westward of funds to move crops, the demand for which abroad is heavy and must be supplied by us. It cannot possibly be that we are to have the best crops for a number of years, in which are included an immense surplus of grain, cotton, tobacco and provisions, with an active market abroad for all these products—our debts practically paid up at home, and the farmers rich in money and freed from encumbrances—without experiencing a return of prosperity to the iron trade, which is the basis and substructure of all the industries which minister to the wants of the people. By the coming spring we will see the effect of this, and before another winter we will have forgotten the panic until another comes. That our manufacturers have been making efforts for Mexican and South American trade has been several times noted. I was not, however, prepared to believe that it had already attained any great proportions until taking up a Spanish paper, *El Progeso*, of Vera Cruz, in an iron house lately, I found the advertisements of many of our best known manufacturers in machinery, tools, steam hammers, glassware, gas, water and steam pipe, etc. I also learn that where none of these products three years since could have been sold of American manufacture, now we were supplying them almost to the exclusion of English goods. Thus from Ecuador comes an order for iron beams, roofs, shedding, galvanized plates, and an entire out fit for a machine shop. Guatemala sends for a considerable quantity of cast and wrought iron, gas and water pipe fittings and gas tools. Mexico is buying largely of portable gas machines, using petroleum as the gas material, and, also, to some extent, of machine tools. All these orders, which are now being filled here, indicate that the manufacturers of the Atlantic slope are seeking and developing the proper market for their surplus products, and that while little noise has been made about it, a very fair beginning has already been made in a trade which, in the future, will be of the very first importance. The East Coast of Central and South America and Mexico should be naturally supplied by the Atlantic States, and to this the trade will soon come.

In a previous letter I alluded to the project of forming an Industrial Museum on the plan of the South Kensington Museum, of London—to occupy Memorial Hall after the Centennial. A meeting of the projectors with the State Supervisors and city and park officials was held this week, at which the plan was explained, the object and success of the Kensington Museum shown, and the following scheme for a similar school here adopted: The institution will be known as "The Pennsylvania Museum and School of Industrial Art," and will embody a museum of art in all its branches, as applied to industry and technology, giving instruction in drawing, painting, wood cutting and designing in application to industry, through lectures, practical schools and special libraries. The government will be in the hands of corporators appointed by act of Assembly, consisting of 32 trustees, 20 of whom are to be chosen by the members, including the Governor of the State and mayor of the city, with representatives from the Legislature, councils of the city, Academy of Fine Arts, School of Design, University of Pennsylvania, Franklin Institute, Park Commission and Board of State Centennial Supervisors. The necessary steps were taken to form the museum, and the project meets with such universal favor as to insure its success.

The statistical report of the secretary of the American Iron and Steel Association, issued to the members October 1st, 1875, has just been issued in neat pamphlet form, and in addition to the amount of statistics already published in your columns, contains some very valuable reference tables of production, imports, exports, etc. Among the interesting features not hitherto noticed is a table of the *imports of iron ores* for the fiscal years from 1870 to 1874 inclusive, which shows that the value of ores imported yearly has increased from $34,604 in 1870 to $138,514 in 1874. In view of the fact that we have in this country ores of precise constitution as to purity, and greater richness in metallic iron—we speak advisedly—than those of any other country in the world, it is simply a crying disgrace to the trade that iron ores are imported to the value of $138,514 in one year, and that a panic year. We can safely offer to furnish a duplicate, in purity, of any ore imported, not excepting manganiferous ores, suitable for spiegel or ferro-manganese production, from American sources, and at less price, duty on foreign ore considered, than any ore can now be imported. The Secretary of the Iron and Steel Association will add to his valuable contributions to the statistics of the industry by obtaining, if such be possible, the entire statistics of iron ore raised in the United States annually, character, quality, price at mine and at market, freights, etc.

By an unfortunate accident to the framework of an annexe to Agricultural Hall, at the Centennial grounds, on Monday last, some eleven men were injured, none, however, fatally. The accident will not delay the completion of the building, and was owing to the high wind prevailing at the time.

The public still await the exhibition of the Keeley motor with natural incredulity. I. P. Morris & Co. are said to be building the machine, and the inventor is to add the "mystery" to it after it leaves their shop. Meanwhile other new motors are appearing, one of which was exhibited the other day, the power of which is gas generated from petroleum, and in which a gallon of coal oil runs the machine—size not given—for ten hours.

The Chester Rolling Mill, although only a few months in operation, has already so much trade as to demand an extension of plant, which is now being supplied in a new Siemens heating furnace and train of rolls.

The success of the Whitwell Hot Blast in this country continues to attract attention. The Rising Fawn Furnace, Ga., continues to make iron on 17 cwt. of coke to the ton by its use, and the superintendant writes: "We have nothing but *good* to report of the Whitwell Hot Blast." The Cedar Point Furnace, Lake Champlain, is reported to be making iron on 23 cwt. of Anthracite coal, ordinary run of mine. The Etna Furnace, Ironton, Ohio, is using it with the Ferrie self-coking apparatus, and reports complete success. Furnace owners adopting this improvement have these tests, in addition to the notable success abroad, before them.

Mr. Wm. E. Morris, a civil engineer of note on canals and railroads, died at his residence here on Saturday. Identified with the early canal system of this State, and later with various railroads and water works, he was well known and greatly respected, and was, in fact, celebrated for his great economy and fidelity to detail in every work he constructed.

Iron Trade Statistics.

We have received from Mr. James W. Swank, secretary of the Iron and Steel Association, copies of his statistical report for the year ended December 31st, 1874. The greater part of the report was published in our issue of September 9th, but the following abstract of two chapters, subsequently added, will be of interest to our readers.

THE CONSUMPTION OF PIG IRON AND RAILS.

In giving the production of pig iron in the United States in 1872, 1873 and 1874, the inquiry naturally arises, What was the *consumption* of pig iron in each of these three years? This can be approximately ascertained for any given year by adding the quantity imported and the home production to the stock on hand at the beginning of the year, and subtracting the stock on hand at the close of the year and the quantity exported during the year. Unfortunately, the exact quantity of stock on hand can never be accurately ascertained for any year, but the labors of this association have made the work of estimating this unknown quantity for 1873 and 1874 comparatively easy and substantially correct, for at the close of each of these years it endeavored to ascertain the quantity of iron that was in the hands of the makers or their agents and unsold. The quantity held by speculators, creditors, importers and consumers it could not, of course, hope to ascertain. With these explanations, we submit the annexed table of the probable consumption of pig iron in 1872, 1873 and 1874. By the phrase "on hand" we will be understood as meaning *all* the pig iron in the country, whether in the hands of furnacemen and their agents, speculators, creditors or consumers:

Pig Iron.	1872. Net Tons.	1873. Net Tons.	1874 Net Tons.
On hand Jan. 1	400,000	700,000	700,000
Imports	295,967	154,708	61,165
Production...	2,854,458	2,868,278	2,689,413
Total supply	3,550,525	3,722,986	3,450,578
On hand Dec. 31	700,000	700,000	1,000,000
	2,850,525	3,022,986	2,450,578
Exported to foreign countries	1,477	10,103	16,039
Probable consumption	2,849,048	3,012,883	2,434,539

We have given to this subject the most careful consideration, and the above is the result of our best judgment. The figures indicate a reduced consumption of pig iron in 1874 of 578,344 tons as compared with 1873, and 414,509 tons as compared with 1872.

The consumption of rails in any given year can be ascertained with a great degree of accuracy by assuming that the quantity carried over from year to year is always about the same, and that the total of imports and production is therefore consumed. Our exports of rails are as yet so inconsiderable that they need not be regarded as affecting the general result. The following table will show the probable consumption of rails in this country during 1872, 1873 and 1874:

Rails.	1872. Net Tons.	1873. Net Tons.	1874. Net Tons.
Production of iron rails	905,930	761,062	584,469
Production of Bessemer rails	94,070	129,015	144,944
Importation of iron rails	381,064	99,202	7,796
Importation of Bessemer rails	149,786	129,511	100,486
Probable consumption	1,530,850	1,148,850	837,695

These figures indicate a reduced consumption of rails of all kinds in 1874 of 311,155 tons as compared with 1873, and of 693,155 tons as compared with 1872.

IMPORTS OF IRON ORE.

Below we present a table, compiled from the Commerce and Navigation Reports of the Bureau of Statistics, showing the value of the iron ore imported into the United States during the six fiscal years which ended June 30, 1875. The quantity imported is not given, but it may be approximately estimated in tons at one-half the value given. This value is the invoice value, which is fixed at place of shipment, and it probably has not averaged during the years named more than two dollars a ton; hence the division by two, as we have suggested, to find the tonnage. The duty on foreign ores is 20 per cent. *ad valorem.*

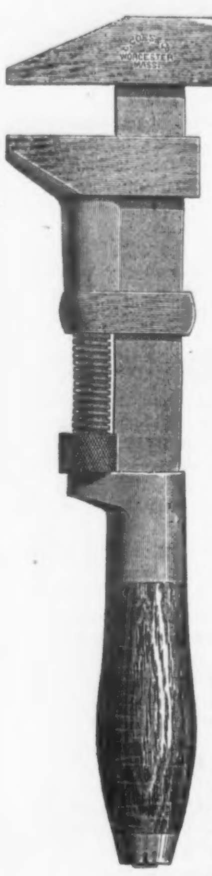
Fiscal Years.	New York.	Boston.	Baltimore.	San Francisco.	Lake Ports.	Philadelphia.	Other Ports.	Total.
1870..	....	....	....	....	$34,499	....	$105	$34,604
1871..	$153	....	....	....	68	....	143	362
1872..	2,116	....	....	....	49,607	....	1,590	53,313
1873..	29,183	$1,434	....	$985	92,856	....	575	125,032
1874..	21,544	173	$11,530	....	105,167	....	110	138,514
1875..	16,263	....	....	....	74,425	$55,806	65	146,659

Important Failure in Pittsburgh.—The announcement was made on Saturday that the well-known iron manufacturing firm of Rogers & Burchfield had suspended payment. It was known that they had been embarrassed for some little time past, but it was expected that they would arrange their affairs and proceed with their business. This seems to have been impossible, however, and the suspension followed. Messrs. Rogers & Burchfield have two mills, the "Iron City" and the "Siberian," one situated at Leechburgh and the other at Apollo, Armstrong county. They were extensively engaged in the manufacture of polished sheet iron.

L. COES'

Genuine Improved Patent

SCREW WRENCHES.



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Worcester, Mass.

Established  in 1839.

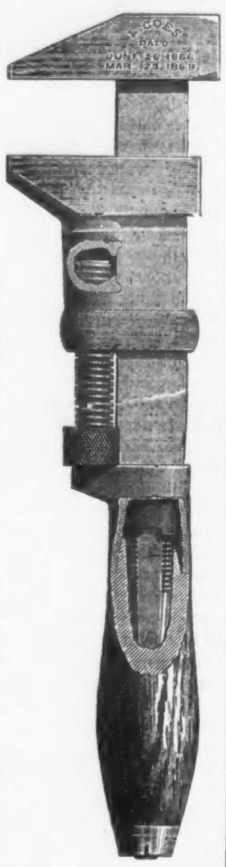
Registered March 31, 1874.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

"L. COES & CO."



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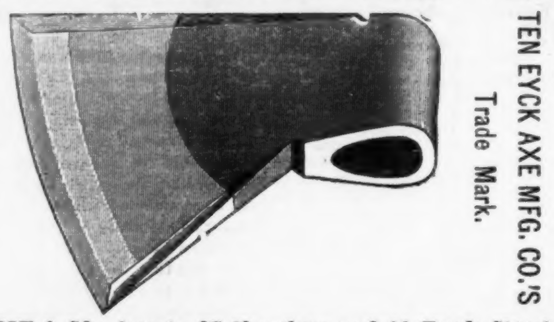

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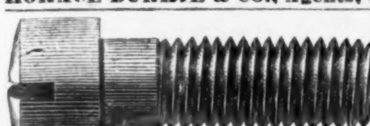

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One-sixteenth to five-eighths diameter.
Heads and points to sample.
IRON, STEEL and BRASS.

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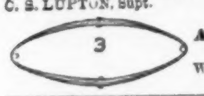

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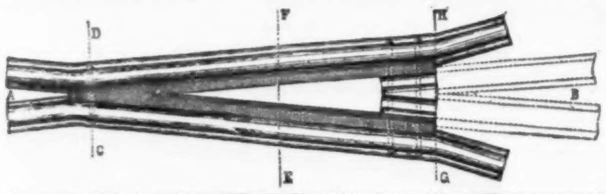

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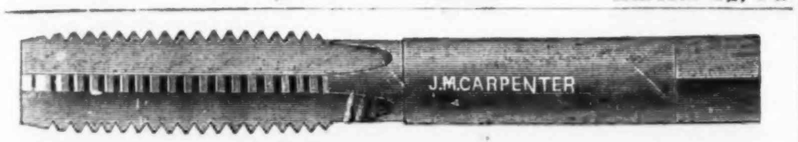

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Will Run Easier, carry a Larger Load, and Wear Longer than any other Axle in the Market.

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D. ARTHUR BROWN & CO., Fisherville, Concord, N. H.

Philadelphia Star Bolt Works.

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Carriage and Tire Bolts,

From the Best Brands of

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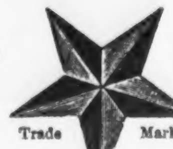

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All Styles of

FANCY HEAD BOLTS.

Blank Bolts, Skein Bolts, Square Head Bolts, Plow Bolts, &c., &c., &c.

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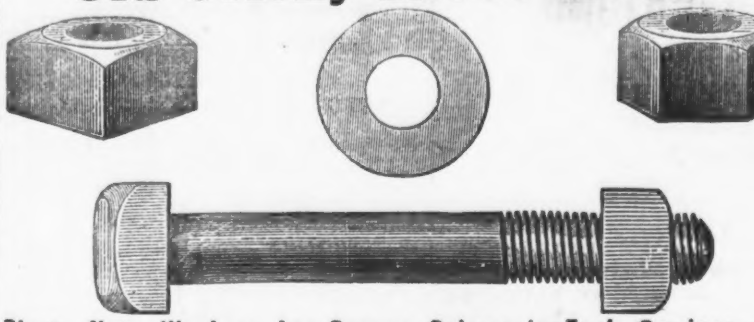
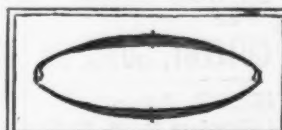
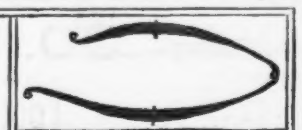
Old Colony Rivet Works.



Rivets, Nuts, Washers, Lag Screws, Coleman's Eagle Carriage and Tire Bolts, Axle Clips, Felloe Plates, Shaft Couplings, Stove and Machine Bolts, Driling Machines, Tire Benders,

&c. Full stock constantly on hand. Warehouse, 34 Warren St., N. Y.





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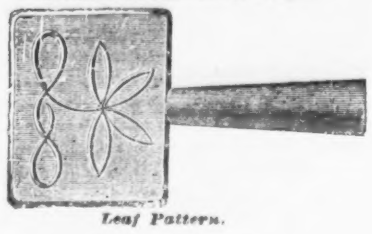
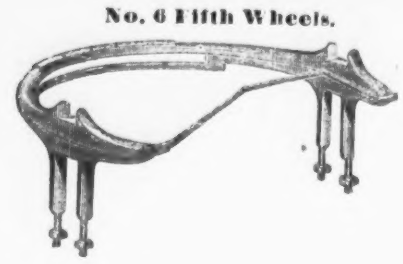


Leaf Pattern.

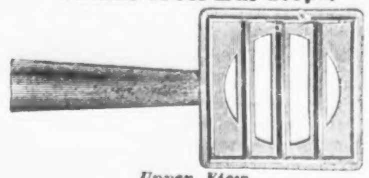
King Bolt Yokes.

No. 6 Fifth Wheels.



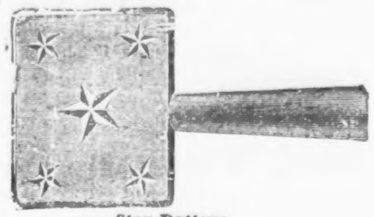
1871 Pattern Shaft Couplings.

Patent Cross Bar Steps.



Upper View.

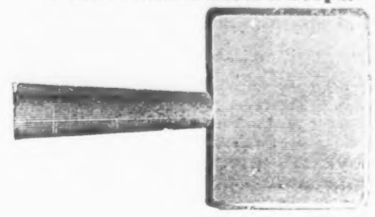
Lower View.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.

Solid Plain Pattern Steps.



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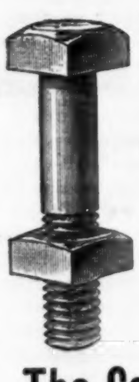

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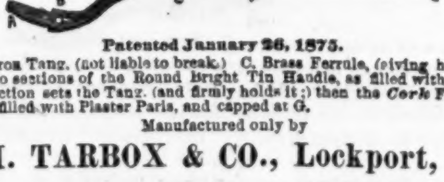

Patented January 26, 1875.

A B, Malleable Iron Tang, (not liable to break.) C, Brass Ferrule, (giving handle neat finish.) H H, shows the two sections of the Round Bright Tin Handle, as filled with Plaster Paris and Cork. The first section sets the Tang, (and firmly holds it;) then the *Cork F* is introduced, and balance of Handle filled with Plaster Paris, and capped at G.

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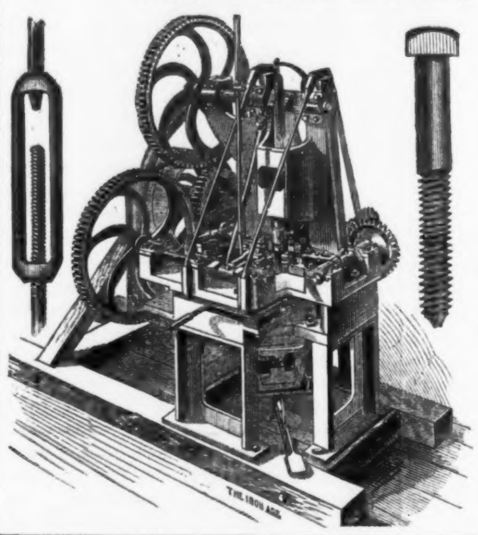

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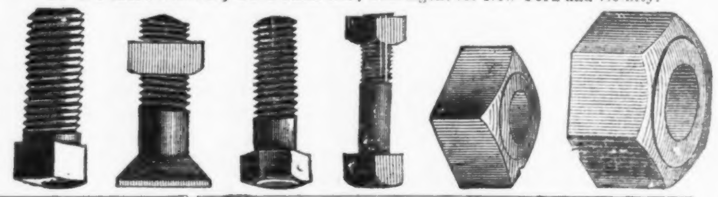

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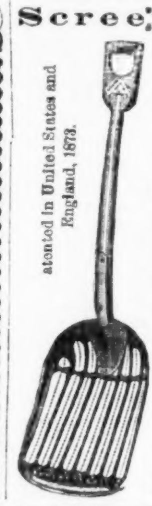

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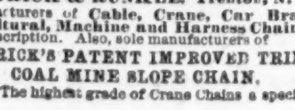

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The Iron Age.

New York, Thursday, October 21, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

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City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*: also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

Successful Invention.

To invent and improve may be said, without much exaggeration, to be American habits. Some one once said that the first thing a New England baby does is to examine his cradle, to see whether he cannot improve upon it in some way. Certain it is that the inventive mania takes possession of a very large proportion of Americans quite early in life. Whether this desire assumes the definite form of a purpose, depends very much upon circumstances. Merchants and professional men make comparatively few inventions; but mechanics, and especially the large class of jacks-at-all-trades, who engage in any business which seems to afford a reasonable promise of profit, make a great many. There is no reason why the spirit which prompts to the labor and thought usually supposed to be expended upon inventions, should be discouraged. It produces manifold useful results to the community, and does no harm to the individual, unless he allows himself to be deterred from honest labor by the delusive dream of wealth and honors easily won by mere ingenuity. Comparatively few, however, of those who belong to the class of inventors, make public more than one invention, for the reason that only a very small percentage of patents return to the owners the money expended in obtaining them. This fact commonly discourages second attempts in this direction. Of those who make numerous inventions, a majority are men who seem impelled to effort in this direction by an irresistable impulse. They are mostly impractical men, without the capacity for acquiring business habits. Like artists, poets and authors, they live chiefly in the realm of ideas, and their interest in an invention commonly ceases as soon as it is perfected. Each new idea seems to them the one which will bring them fame and fortune; and it is by no means unusual to see inventors sell the valuable fruits of years of labor—patents which should enrich them—for enough to enable them to follow another *ignis fatuus* which dazzles them for the moment. There are some, perhaps many, conspicuous exceptions to this rule, but it remains the rule notwithstanding. Professional inventors, like poets, are "born, not made." They, too, are poets in one sense, but, unlike a great majority of their brethren who invent rhymes, they do a great deal of good in the world and contribute much to the progress of civilization. The fact that others commonly reap what they have sown, is their misfortune. Your true inventor is seldom mercenary and rarely covetous of honors. He invents because he cannot help it. Unfortunately for himself, but fortunately for the community at large, his genius is abnormal. It cannot conform to the rules of every day life, nor can it be harnessed or trammeled by business habits. To such men we have nothing in the way of advice to give. They are doing all the good in the world of which they are capable, and if they do not win fame or profit, they have the satisfaction of knowing that it is not because they do not deserve them, and that both are often bestowed upon men less worthy than they.

We have, however, a few words of friendly counsel for practical mechanics, who look upon success as the end and aim of effort, and who, if they invent at all, do so for profit. Men of this class—good mechanics without genius—make the great majority of our inventions and contribute the greater part of the revenues of the patent office. The fact that only a very small percentage of patents are worth anything, is sufficient evidence that only a very small percentage of inventors labor wisely. Those who have plenty of money to spare, may derive enough satisfaction from having a patent to compensate them for the cost of getting it: those who have not, and must draw upon the slender margin of their savings during months of hard work, and deny themselves all but the bare necessities of life, to pay attorney's fees and patent office charges, will be disposed, we think, to regard the subject more practically. It is to these we address our remarks.

Up to within a comparatively few years, an inventor, whatever his method of working out his ideas, could scarcely go astray. The laws of nature were not sufficiently understood to render it possible for engineers and mechanics to work out a progress mathematically. Science was largely empirical, and the progress of the arts tentative rather than inductive. Whatever was invented made a contribution, great or small, to the world's knowledge. Within the past few years, however—that is, within the memory of living men—the progress of the arts, the improvement of machinery, tools, labor-saving appliances, processes, &c., has been so rapid and general, that the task of inventing and improving is attended with practical difficulties formerly unknown. In almost all directions progress has been pushed up to a line which the chance inventor rarely succeeds in crossing successfully. Sometimes men receive revelations of truth which come to them as inspirations, and valuable inventions are occasionally conceived in a moment by ingenious people, so complete as to require little thought or labor to put them in practice. Such good fortune, however, seldom falls to the lot of any but men of genius, whose minds are so constituted that they grasp a complete idea almost intuitively, and without being conscious of the intermediate mental process by which it was worked out. For example, many of the mathematical prodigies who have lived, of whom the late Zera Colburn was a type, have had a genius akin to that of the successful chance inventor. They would give answers to difficult mathematical problems with a rapidity which seemingly gave them more the character of discoveries than of results obtained by any mathematical operation. Problems which common mathematicians would have to work out upon reams of paper, they would solve almost off hand. To follow this method, however, would not make the average man of intelligence a great mathematician. The same is true of invention. When the steps of mechanical progress were, comparatively, as simple as the division of four by two, chance invention was easy. A want was seen or experienced, and the means of supplying it suggested themselves. Often the accidental discovery of the means suggested the idea of the need, and the two naturally shaped themselves into an invention. Now, however, the conditions are changed. In nearly all departments of industry the easy steps forward have been taken, and while in no direction have we approached the limit of progress, we have little of value to hope for from chance inventions or accidental discoveries. With this fact in mind, the mechanic who desires to invent something will better understand the nature of his task and its difficulties.

Before a man wastes any time or money upon an invention, he would do well to find out whether there exists a need for the article or process he proposes to bring before the public; whether this need has been met by any one else, in the same or any other way; whether his invention will accomplish anything not already done equally well; and, what is most important, whether he knows all he can learn about the state of the art, and of such branches of applied science as may bear directly or indirectly upon the subject he is considering. The radical defect of most inventions now-a-days is that they are prematurely made public by men who have not given them proper study. They may accomplish fairly well the object sought, but no better than it is accomplished in half a dozen other ways in general use, and often not so well. We might instance a multitude of car couplings, corn planters, wooden pavements, coffee pots, &c., protected under costly letters patent, which are of no more value than so many last year's birds' nests. Had the inventors given the subjects half the intelligent study and consideration which should have been bestowed upon them, they would have either invented nothing or their work would have had some value when finished. Among the specifications and claims presented to, and in too many instances allowed by, the Patent Office, it is not unusual to find ideas as old as civilization, long ago abandoned or replaced by others of more value. No doubt a very great part of the labor expended in elaborating inventions consists in traversing ground gone over time and again by those who have made efforts in the same direction; and if inventors would take the trouble to prepare themselves for their work by reading and study, they would be saved a vast amount of unnecessary labor and a great deal of very bitter disappointments.

It is the habit of would-be inventors to essay the easy problems, already solved satisfactorily, and shirk those which are attended with serious, though not insurmountable, difficulties. For example, thousands of men have "invented" oil boxes for railway cars, and new methods of supplying oil to the journal, but not one in a thousand of them have ventured to attempt an invention which will make the ordinary oil box dust tight. The one problem is easy, and has already been solved in a dozen different ways; the other is difficult, and requires study and experiment. But the difference is just this: A new method of supplying oil to the journals of cars is not needed, and would not bring the inventor any honest return: a method of making oil boxes dust tight is very much needed, and would probably yield the successful inventor an ample fortune. We might add numerous examples of this kind, but it is unnecessary. They merely show the importance of preparatory investigation and study.

Lastly, we counsel honesty in invention. The man who steals the fruits of another man's labor, commits an act as dishonest as if he stole the savings of his wages. Dishonesty of this kind seldom prospers. Unfortunately, our patent laws legalize a great deal of this kind of piracy, and the courts afford but tardy redress to those who can support conclusive proof with the contents of a full purse.

During the week ended October 16th, the Isabella Furnace No. 2, at Etna, Pa., made 714 tons and 1240 lbs. of pig iron. The largest cast in any one day was 112½ tons, of which one-third was No. 1 and the rest No. 2. So far as we are able to state from information at hand, this is the largest amount of iron ever made in any one stack in the same space of time. It excels the best performances of Isabella No. 1, and gives a larger total than we have ever heard claimed for any furnace in or out of blast.

British and French Seamanship.

The English press have long delighted in ridiculing French seamanship. Even in so blundering a piece of business as the loss of the Vanguard by the Grand Duke, or the sinking of the Mistletoe by the royal yacht Albertus, the worst the newspapers could say was that such accidents were of the kind which might be expected in the case of vessels commanded by Frenchmen, but in the case of English vessels they were simply incomprehensible. We had a taste of this kind of criticism in the British comments upon the loss of the Ville du Havre, while, in the case of the Atlantic, it was asserted that, had Captain Williams been a Frenchman, the running of his vessel upon the rocks off Mars' Head would have occasioned no surprise. No doubt the British tars entertain a profound and honest contempt for everything that carries a French flag at sea, especially French sailors, but the records of British navigation are not so clean that the former can give quite such forcible expression to their views without inviting unpleasant comparisons.

When during the winter of 1873–4 the French Trans-atlantic Steamship Co. lost in rapid succession the Ville du Havre and l'Europe, and abandoned l'Amerique at sea, it did look as if the company had been peculiarly unfortunate in its choice of officers and men. Many of the circumstances attending these notable disasters certainly called for severe criticism, especially the wretched management and subsequent abandonment of l'Amerique; but a careful examination of the records of disasters to British steamers shows that the French have much to say by way of reply. Since the beginning of the present year there have been lost thirty-two British merchant steamers of large tonnage, of which the following are some of the most important:

The Royal Mail Steamship Co. lost in August the steamer Boyne, 3518 tons, on a homeward voyage from the river Platte to Southampton. She was wrecked on a reef off Brest, France. In September the same company lost the steamer Shannon, 3472 tons, at Jamaica, on a trip from Southampton to Aspinwall. Of steamers of modern sizes, we have the following: In February the Hong Kong, 1881 tons, sunk near Socrata, on her way from London to Japan; the Life Brigade, 1512 tons, bound from Liverpool to New Orleans, wrecked on Gingerbread Ground; the Soudan, 1108 tons, belonging to the African S. S. Co., wrecked at Madeira, and only one month after, the loss of the Monrovia, 1019 tons, by the same company, in the roadstead of Lagos. In March there were lost the Union Steamship Company's Celt, 2095 tons, at Queens Point; and the Maraldi, 1002 tons, of the Lambert & Hall line, at Bahia. In May the Caledonia, of the Liverpool and Bombay line, was wrecked at Point de Galle. In June the Vicksburg, 2484 tons, of the Liverpool Canadian line, was wrecked against an iceberg on a trip to Quebec. In July the John Tennant, 2293 tons, of the General Navigation Company's line, was wrecked on Cape Finisterre, on her way from Calcutta to London. Since then the steamers lost have been mostly of smaller tonnage than those mentioned, but as many have not been heard from, it is presumed that all on board perished. Even allowing for the size of the British steam marine, the proportion of losses is unprecedentedly large. The fact is in great part explained, no doubt, by the inferior character of most of the cheap iron steamers now built in England, as well as by the criminal practices of owners, to which Mr. Plimsol has called attention; but there remains enough foundation for a counter charge of bad seamanship, if the French navigators see fit to make it.

First-Class Cook Stoves and Ranges.

Under the conditions which now govern the business of stove founding, few of the large manufacturers, whose energies are chiefly directed to bringing out as great a number of novelties as possible, can afford to devote either the time or the expense to careful and accurate experiment, which is essential to the production of really first-class stoves. They are compelled to meet from year to year the changing requirements of the trade, and as few stoves now made are expected to have a run of more than two years—if as long—external appearance is of more importance than quality of materials, excellence of workmanship, durability, or convenience and economy of operation. We do not say that these considerations are wholly disregarded, for when a manufacturer gets up a new stove it may be presumed that he will make it as good as he knows how. If he makes the patterns, he will design them as well as he can; if he buys them he will probably rely chiefly upon the judgment of the pattern maker, who may or may not have a correct and complete understanding of the requirements of a first-class stove. But while fully aware of the fact that every manufacturer would rather make good stoves than poor ones, it is evident that they do not, in most cases, know what they are going to do until it is done, nor do they know whether their new stoves will work well or not, until those who have bought them for use determine their value in every day service. If no complaints are made, the manufacturer concludes that his stove is satisfactory; if complaints are received, and stoves are returned by dealers, he begins, commonly for the first time, to try the stove for himself and see how it will work under average conditions. This hap-hazard method is, perhaps, the only one which the large stove manufacturer, who makes an extensive line of stoves, and is all the time changing his styles, can follow, but it is a wrong method, and one which will do more than anything else to bring novelties into disrepute and create a demand for a better class of stoves than can now be found in the market. We are satisfied that it is the policy of the small manufacturers at this time to devote their attention to specialties and make these specialties thoroughly good. Those who do this, while they may not make a profit as great as might be expected upon a larger production of cheap goods, will build up a reputation for their goods, and lay the substantial foundations of a trade that will not be affected by the conditions which now make stove founding a business of great risk and uncertain profit.

In the line of cook stoves, especially, there seems to be room for a great deal of profitable experiment, which only the small manufacturer seeking a high reputation can afford to make. The subject is somewhat too comprehensive to admit of exhaustive discussion in the limited space at our command, but as it is one of much interest to a very large class of our readers, we will venture a few suggestions as to the direction in which we think an important progress toward a higher standard of excellence could be made with no great outlay of capital.

Few cook stoves or ranges now in the market are as economical of fuel as they should be. The reason for this is found in the fact that a great deal of heat is wasted by radiation, or allowed to pass into the chimney with the gases generated by incomplete combustion. We know of ranges which have an enormous capacity for consuming coal, but they will broil the cook long before they do a beefsteak, and heat a kitchen above the temperature of comfort much quicker than they will boil a tea kettle. We know of a cook stove still in use in which 32 pounds of coal baked a barrel of flour. To do this the oven was filled twenty times, resulting in the production of 300 pounds of light, evenly baked bread. The conditions under which this was done were identical with those under which the stove would be used by a good housekeeper. The whole charge of 32 pounds of coal was put on when the fire was kindled, and beyond an intelligent manipulation of the dampers, the fire received no attention during the whole fourteen hours occupied in the operation. Now, we have no hesitation in saying, since the trade all know it, that not one in fifty of the first-class cook stoves now sold would begin to approximate this economy under the most favorable conditions, and the most skillful management. The best average would probably be half a barrel of flour indifferently baked with 32 pounds of fuel. To raise the standard of baking efficiency, and by so doing improve the stove, until a much greater economy of fuel than is now secured shall have been attained, should be the aim of every manufacturer of stoves who desires to make a reputation for his goods.

As now made, a very large proportion of the stoves in the market are liable to crack, and in addition to the dissatisfaction which this causes, the consumer is put to the expense and inconvenience of procuring odd plates and having them fitted, or of getting a new stove. For this cracking there is no excuse. We know of stoves which have been in the market many years which have never cracked—at least, the manufacturers have never been called upon to supply odd plates to replace those destroyed by cracking. The whole secret of making stoves which will not crack lies in the selection of suitable iron, and a proper proportioning throughout. There are points on which it is possible to get exact information by careful and intelligent experiment—and in no other way.

The best and most economical stoves ever built, judged by any generally accepted standard of excellence, have had shallow fire boxes; the whole tendency of "improvement" now-a-days seems to be to make the fire boxes of stoves and ranges narrow, long and deep. This seems to us

a serious error. In such a fire box it is, we think, impossible to keep a fire clear and bright without continuously and skilfully "jockeying" it, and wasting a great deal of fuel. Under the care of a cook the fire not only never becomes very bright on top, but before the coal is fully ignited it begins to deaden at the bottom. When any clinker is formed on the sides, still further reducing the space, this difficulty increases. With a broad, shallow fire box, a better and hotter fire can be kept for a longer time with less attention and less fuel. This is shown by the experiences of many years past in the generation of steam. A broad, thin fire is vastly more efficient than one in which the same weight of fuel is burned in a deep, narrow fire box, and the principle applies as well to stoves as to steam boilers. In our judgment, formed after careful inquiry among those who rank highest as experts in the trade, a cook stove fire box should never be more than five inches deep, and the grate should be so arranged that the thickness of the fire shall not exceed four inches, the surface of which shall be so near the top of the stove that a kettle of cold water will boil in 30 minutes. In many of the cook stoves now made, a kettle set over an open hole can only be made to boil by placing a stick of wood on top of the coal. The proper proportioning of the fire box is a matter of vital importance as affecting the efficiency of the stove, and too much attention cannot be given to it.

Careful experiments have shown that the water-back, or water-front, of a range should not come in direct contact with the fire, as in most ranges. They absorb so much heat as to deaden the fire on one side and seriously interfere with the operations of the oven. The oven is a feature of a cook stove or range upon which a great deal of attention could be probably bestowed by the founder who expects to sell his goods on their merits. The requirements of a good oven are various and imperative: We have seen ovens which would bake one loaf very well, and two or three loaves with careful turning, but when full they would not bake at all. So much heat was absorbed by the dough that the temperature of the oven was reduced below the point at which satisfactory baking was possible. A stove which will not bake an oven full is not a first-class stove, whatever its merits in other respects. As a test, let any manufacturer of a stove with a 20x22 inch oven, place therein 16 pounds of dough in a pan which completely covers the bottom. This amount of dough should make a loaf the size of the pan and five inches high when done. If the oven will bake this loaf the same color on all sides, top and bottom included, without requiring it to be turned, it may be pronounced good; if it will bake a dozen successive ovens full in the same way, it is first-class, but not otherwise. A first-class cook stove should bake all day the same, and a stove which will not do this falls below the standard of excellence which was reached years ago in the case of one famous make of stoves not now manufactured. These are matters of little concern, perhaps, to the great houses competing on a class of stoves in which cheapness is of more account than excellence; but to the small manufacturer, who desires to build up a trade in standard stoves and specialties, they are of vast importance. The stove business is a great and growing industry, representing an enormous invested capital and consuming a great deal of iron. The trade in stoves, already immense, is steadily growing, and in addition to a home market of continental extent, in which our manufacturers encounter no foreign competition, there is a steadily increasing export demand for certain classes of stoves adapted to foreign markets. It is a mistake to suppose that this trade, even under existing conditions, does not call for really first-class goods, as well as for those first-class in name and external appearance only, but which are made and sold without test or experiment to determine their economy or efficiency. We are satisfied that there is room for standard goods at first-class prices, and manufacturers who cannot compete on new goods with houses having larger capital and more extensive facilities, would do well to be prepared to take advantage of the growing demand for really first-class stoves and ranges. What we have said in another article on this page, concerning the methods of working which must be followed by those who seek success in the field of invention, applies equally to all efforts looking to the improvement of stoves. The difference between a stove which is efficient and economical and one which is not, is often so slight that, to discover the defect and find the means of correcting it, the manufacturer must rely upon something beside ingenuity supplemented by practical knowledge gained in the foundry. The late P. P. Stewart worked with untiring industry for 30 years to improve the cook stove which bore his name, and the results were a historic reputation and a pecuniary profit which, all things considered, are greater than were ever made before or since on any one stove. Those who desire a like success will do well to seek it by like means.

Female Labor in Iron Works.

Recent reports by Mr. Baker, Mr. Brewer and others, employed by the British government as inspectors and sub-inspectors of factories, call attention to a condition of affairs in certain districts growing out of the employment of women in iron works, which are well calculated to excite surprise. In the Black Country the labor of women and children in the mines and iron works is very general. The men employed in these trades earn large wages, but they mostly spend them upon themselves and let their wives and children earn enough to support themselves by labor of a kind which only those of robust health and exceptional physical strength can perform without breaking down. More than this, we are told that it is the custom for these men to work only half the week and subsist during the remainder of the time on the earnings of women and children, squandering their own earnings in drink and dissipation. In commenting on Mr. Baker's report *Iron*, says:

This state of things has produced a great outcry in the chain and nail making districts, it being taken as a personal injury by the nailers and chain makers, who make their womankind toil early and late, that the wives of highly paid artisans, like puddlers and colliers, should crowd the market with their labor. These worthy gentlemen, who are far more addicted to beer and dog racing than to work, of course see the thing from their own point of view. The wife of a highly paid artisan will work cheaply for one of two reasons: If she have an industrious husband who makes full time, all her earnings, big or little, are a clear addition to the family property; if she is blessed with a master of a sporting turn, she will work night and day to get something to satisfy her half-starving children—not at the price straightforward masters would give, but "for any price any crafty knave of a master chooses to offer." The effect, of course, is to keep down wages to the lowest ebb. This is nothing new, and has been felt in every trade included in woman's sphere of work. A woman married to a man engaged in some walk of life—if any yet remain—beyond female powers, has, of course, an unfair advantage over her male and female competitors for work if she have a good husband, and a terrible incentive to labor if she have a bad one. This is perfectly well understood by members of trade societies, and explains the violence with which the introduction of female hands is invariably resisted—in every trade. This feeling can hardly be called illiberal, as long experience has shown that the employment of females in any handicraft has the invariable effect of so far reducing wages that four hands are required to earn the wages of a single pair.

The employment of female labor in making chains has, however, an interest for the public additional to that which grows out of sympathy for women. Mr. Baker calls attention to the fact that as "women are often obliged to use 'olivers' "to wield their chain links, weakly work, "or occasionally bad iron, may be introduced into the fabrication of cable "chains, on the safe holding of which "many lives may depend in rough weather "at sea. At all events, there is so much "suspicion about them that it would be "better for the strength of all cable chains "to be tested by some government official "and stamped, before they are trusted for "such purposes."

The Origin of Steam Railroads in England.

The celebration of the fiftieth anniversary of the opening of the Stockton and Darlington Railway, held at Darlington on Monday and Tuesday, September 27th and 28th, suggests very strongly, in the minds of most practical men, a consideration of the graduated stages of development whereby the principal factor in the railway system—the locomotive engine—has attained its present importance and perfection. It is well known that steam locomotion is no new idea, in the sense of being a production of the present century. So far back as 1759 the possibility of producing locomotion on land by steam-power was suggested by a Dr. Robinson, of Scotland; and James Watt patented in 1784 an application of his engine to the movements of carriages, although it never came to anything like a practical result. Trevethick completed his high pressure locomotive engine with only one cylinder and a fly-wheel to secure rotary motion at the end of each stroke in 1802; and an engine made by him was tried two years later on one of the tramways then open in Wales. Blenkinsop, in 1811, took out a patent for a locomotive engine worked by a rack or toothed rail. It was employed at the Middleton Colliery Railway, near Leeds, in 1812; and an engine of similar construction was in the following year used at the Cox Lodge Colliery Railway, on the Tyne, in 1813. In this year also an engine, constructed by Chapman, was placed on the Heaton Colliery Railway, and Brunton tried on the Newbottle Railway an engine propelled by legs. Mr. Hedley's "Puffing Billy," which is now placed in the Kensington Museum, also commenced to work on the Wylam Railway in the early part of this year. This railway was a cast iron tramrod, and Mr. Hedley, doubtful as to whether the adhesion of the wheels upon the railway was sufficient for the engine to propel itself and a load forward, made some experiments on the Wylam tramroad with a carriage made expressly for the purpose, the result being, as stated by his son, that "the friction of the wheels of the experimental carriage alone upon the rails when it approached to the weight of an engine carriage, was sufficient to enable it to overcome the resistance of an attached train of carriages." In this engine the steam was passed from the cylinder into a receiver, from which again it passed into the chimney by a pipe for the purpose of preventing the noise of the injection of the steam into the chimney; and it has been said that by the operation of "this system the pipe got furred or partially choked, and when the obstruction was removed it was found that steam could not be generated so rapidly, and that to increase the supply the drivers, by means of an iron ring, contracted the orifice of the pipe, and kept it a secret for some time." Thus it is that Mr. Hedley claimed the discovery of the value of the blast in the chimney.

It was about this time that Stephenson came upon the ground with his Killingworth engines. Mr. Nicholas Wood tells us that, "soon after Stephenson had become established as engineer to the partnership collieries, in 1813, his attention was drawn to the cost of conveying the Killingworth coals by horses, where one horse only took three chaldron wagons, or about eight tons of coals, at a time. He had inspected the locomotives at Heaton and Cox Lodge, which had been abandoned, and that at Wylam, which was at work. The latter engine was working on a plate rail, and with this information of what had been done, he set to work to construct an engine. The first question was as to the adhesion of the wheels upon the round top rails, and several experiments were made by Stephenson and myself on the adhesion on such rails. Having been satisfied on this point, Stephenson discarded any extraneous assistance to propel the engine forward, such as employed by Chapman, Brunton or Blenkinsop, simply coupling all the engine wheels together, so as to have the adhesion of the whole weight of the engine."

On July 27, 1814, the first locomotive engine which propelled itself by the adhesion of the wheels on the round top rails was tried on the Killingworth Colliery Railway. The steepest gradient on that line was 1 in 450, which it ascended with eight loaded wagons weighing altogether about 30 tons, at the rate of four miles an hour. This engine had two 8 in. cylinders with 24 in. stroke, these cylinders being let vertically into the boiler, and the piston rods carrying crossheads, from each of which a pair of side rods passed down to cranks at the end of a cross shaft. Each of these two crank-shafts was geared to the axle next it, while an intermediate spur wheel geared the two crank-shafts to each other. The boiler was 8 ft. long, 34 in. in diameter, and was traversed by a single straight 20 in. flue, and it was soon found that the greatest defect of the engine was the comparatively small quantity of steam generated in a given time. Hence, we are told by Mr. Nicholas Wood, the steam from the cylinder was passed into the chimney by a pipe which, as the mouth of the pipe was turned upward, served the purpose of a blast. For the actual discovery of the application of steam blast, however, there have been numerous claimants, and the evidence bearing upon the question is too voluminous to be discussed on an occasion like the persent. Respecting the several successive improvements which Stephenson made in his original Killingworth engine, Mr. Wood has told us that "cog wheels were, first of all, superseded by an endless chain, to secure the adhesion of the four wheels; next by a system of cranks with side rods. The improvements in the construction of the locomotive engine by Stephenson, over those at that period in use, viz., that on the Wylam tramroad, and Mr. Blenkinsop's, at Leeds, was in the application of two cylinders, instead of one in the former engine, and in the mode or modes of communicating the action of the pistons to the driving wheels of the engine, and the application of the power of adhesion on the round top rails to propel the engine and load, without the intervention of racked rails or other contrivances to propel the engine forward. The first engine on the Killingworth Railway had four three-feet driving wheels. Four-feet wheels were afterward used, by which an increased effect was produced by the diminished friction of the working parts of the engine, and by the increased speed which was attained."

Stephenson's engine continued to be used at Killingworth Colliery until 1822, when the Stockton & Darlington Railway was in course of construction, and it became a question with Mr. Edward Pease and his colleagues in the directorate of the concern whether they should use only horses, or resort to the then little known application of steam locomotion. Smiles has, in his life of Stephenson, detailed the circumstances under which that gentleman succeeded in persuading Mr. Pease to adopt the locomotive. Such a resolution having once been taken, it became an important question where the locomotives could be built. There were then numerous general engineering works in the North of England where the work might have been undertaken, but it seemed to Mr. Pease that there was an opening for the construction of works specially adapted for the building of locomotive engines. In this view he was supported by his cousin, Mr. Richardson, who had made a large fortune in London as a bill broker, and these two gentlemen jointly furnished the means for the erection of the Forth Street Engine Works, at Newcastle, where the first engine used on a public railway was made under the personal supervision of Stephenson.

The two cylinders of the "locomotion" are each 9 in. in diameter, and are placed vertically on the top of the boiler, half in and half out, each piston rod carrying a crosshead from which a pair of side rods pass down to the cranks of the corresponding pair of wheels. The crank pins of the trailing wheels carry return cranks, the pins of which are coupled to the crank pins of the leading wheels, so as to keep the cranks of the leading and trailing wheels at right angles to each other. The length of stroke was 24 in. The pistons are of metal, with brass rings and hemp packing. The boiler is 12 ft. long by 4 ft. diameter. It has one through tube 2 ft. in diameter and 11 ft. long. At the end of this tube the fire grate is placed, and the total heating surface is only 60 square feet. The chimney is 17½ in. in diameter. The wheels are four in number and each 4 ft. in diameter. They are put together in two halves, being cast in two circles. The inner circle is wedged on with a wooden plug, and hence they were called plug wheels. Two flat sides are worked by a loose eccentric sheave and bell cranks. The pump is 4 in. in diameter, and worked from a crosshead on one of the pistons. The tender has four metal wheels, each 2 ft. 6 in. in diameter, and it has a small square tank on the top, which contains about 240 gallons of water. The feed pipes are of leather. The frame is made of wood and very light, the total weight of the engine in working order being only 6½ tons. It was calculated that the nominal power of the engine was equal to that of sixteen horses, and the capabilities of the engine have been estimated as equal to the haulage of twelve wagons at a speed of eight miles per hour. There was no brake on this nor indeed on a number of succeeding engines used on the Stockton and Darlington Railway, and it was not an easy matter to bring it to a stop. After it had been employed on the Stockton and Darlington Railway till 1850, "Locomotion No. 1" was acquired by the Messrs. Pease, of Darlington, and placed by them at their new sinkings at Pease's West Collieries, in South Durham, where it pumped water until 1857, and in the latter year it was taken back to Darlington, and placed on a pedestal in front of the railway station in that town, where it has since stood, an object of interest and curiosity to all who travel on the first public railway on which steam locomotion was employed. The preservation of old "Locomotion" is a matter for congratulation, inasmuch as the exhibition of engines held at the North-road Engine Works during the present week would have lost much of its attraction had this parent locomotive been absent.

From 1825 till 1830, eleven new engines were built for the Stockton and Darlington Railway, mostly with the same structural features as the No. 1 engine. But in those five years considerable improvements had been made in the locomotive. Timothy Hackworth, who came on to the Stockton and Darlington Railway in 1825, to undertake the superintendence of the locomotives, was an engineer of great inventive capacity, and Mr. D. K. Clark, in his history of the locomotive engine, has justly said that up to the year 1830, no one did more than he for its establishment as a permanent railway motor. One of the first improvements which he introduced was the application on a more perfect scale than had previously been achieved of the steam blast. The "Royal George," built in 1827, was the first engine to which Hackworth applied the steam blast. This engine commenced to work on the Stockton and Darlington Railway in October, 1827, and it has been justly described as "the first really efficient locomotive." It had a pair of 11 in. cylinders with 20 in. stroke, placed vertically over the leading wheels, and was mounted on six coupled wheels each of 4 ft. diameter. The boiler was 13 ft. long by 52 in. in diameter, and was fitted with a horse shoe or return flue, whereby the engine was enabled to generate steam more quickly than any of her predecessors. It was equal to hauling twenty-eight wagons at the rate of nine miles per hour. It is really wonderful how perfectly this engine was made when the difficulties of its construction are taken into account. The "Royal George" was built at the first locomotive works at Shildon, which commenced with two blacksmith's fires, and a shed sufficient only to hold two engines of the size of the "Locomotion," and when in 1827 the "Royal George" was built, the accommodation was very little larger. It is to be regretted that the "Royal George," with its many interesting reminiscences, was not available for the purpose of the exhibition which was this week held at Darlington. A similar regret may be expressed with reference to the "Sans Pariel," the next engine which Hackworth built at Shildon. It is now a matter of history that the "San Pariel" was defeated in the Rainhill locomotive competition, in which it took part in 1829, but it was afterward sold to the Bolton Railway Company, and was employed on their line for a number of years. Although the "Rocket," the winner of the Rainhill competition, is not connected with the history of the Stockton and Darlington line, yet, as the first locomotive provided with the multitubular boiler, it may be of interest to give its principal dimensions, so that they may be compared with those of the other early locomotives of which we have to speak. They are as follows:

	Ft.	In.
Diameter of cylinder	0	8
Length of stroke	1	4½
Number of wheels (not coupled) 4		
Diameter of driving wheels	4	8½
" boiler	3	4
Length of barrel	6	0
" firebox inside	2	0
Width " "	3	0
Hight " "	3	0
Number of tubes, 25.		
Diameter of tubes	0	3
	Sq. ft.	
Heating surface: Firebox	20	
" " Tubes	117¾	
Total	137¾	
Fire grate area	6	
	Lbs.	
Pressure of steam	50	
	Tons.	
Weight of engine	4½	

The next engines we have to notice are those of the "Wilberforce" class, designed by Timothy Hackworth. The "Wilberforce" was built by R. and W. Hawthorn, of New Castle, in 1832, for the Stockton and Darlington Railway Company. It had three straight axles, each 4½ in. in diameter, and one hind axle with two cranks keyed on to it. The boiler was 9 ft. 6 in. long by 4 ft. diameter. The cylinders were 14¾ in. in diameter, and the length of stroke was 16 in., the cylinders being fixed outside and placed vertically above the hind axle. The chimney was 15 in. in diameter at the bottom and 13 in. at the top, the length being 5 ft. 9 in. The flue was 7 ft. 6 in. long and 2 ft. 6 in. by 2 ft. 2 in., and there were 107 iron tubes, each 7 ft. 6 in. long by 1¾ in. in diameter. The valve gear consisted of eccentrics and gabs working vertically above the hind axle. There were six metal rim and center wheels each 4 ft. in diameter, and the tyres were 1⅞ in. thick and 5 in. broad. The pistons were of metal with metal packing rings. The tender tank was a barrel made of wood and capable of holding 616 gallons of water. The brake gear consisted of a long lever with adjusting screws and four wood breasts.

In the same year that the "Wilberforce" was built, Hackworth designed the "Darlington," which was also built at Hawthorn's works, at Newcastle. This engine had three straight axles, each 4½ in. in diameter and a hind axle 4½ in. in diameter with two malleable iron cranks keyed on to it. The boiler was 9 ft. 6 in. long and 4 ft. 4 in. in diameter. The cylinders were 14¾ in. diameter, and were fixed vertically to the frame from the end of the boiler, the length of stroke being 16 in. The chimney was 15 in. in diameter at bottom and 13 in. at the top, its length being 5 ft. 1½ in. The boiler was fitted with 88 brass and copper tubes, each 7 ft. 7 in. long and 1¾ in. in diameter. The valve gear consisted of eccentrics and gabs, working vertically at the end of the boiler. The six wheels were of metal, each 4 ft. in diameter with Lowmoor tyres 1⅞ in. thick by 5 in. broad, The wood barrel of the tender held 519 gallons of water. The tender was of wood and carried about one ton of coal. It had four cast iron wheels with Bishopwearmouth tyres and was mounted on springs.

The "Arrow" is another notable engine which was built by Timothy Hackworth, at his own Soho Works, at Shildon, in 1837. This engine had a leading axle 4½ in. diameter, a crank axle 6 in. in diameter, and a trailing axle 4¾ in. in diameter. The boiler was 7 ft. 9 in. long, and 3 ft. 4 in. in diameter, and there were two cylinders, each 9 in. in diameter, placed horizontally, and having a stroke of 21 in. The fire box was of copper, 2 ft. 7½ in. long, 3 ft. 6 in. broad, and 4 ft. 2 in. high above the fire bars. The boiler contained 133 tubes, 8 ft. 2 in. long and 1⅝ in. in diameter. The engine had one pair of driving wheels, 5 ft. in diameter, having spokes of round malleable iron, naves of cast iron, and tyres 1⅞ in. thick and 5 in. broad, and two leading and two trailing wheels of the same description. The tender tank was made of sheet iron, and capable of holding 645 gallons. The tender was furnished with malleable iron horns, springs, wooden buffers and a screw brake, with adjusting screws.

The "Queen" was constructed by Alfred Kitching, of Darlington, in 1838. It had leading and trailing axles 4 7-16 in. in diameter and a crank axle 5¾ in. in diameter. The boiler was 8 ft. 6 in. long by 3 ft. 8 in. in diameter, and there were two cylinders, each 14⅛ in. in diameter, and fixed obliquely inside of the frame. The length of stroke was 17⅞ in. The fire box was of copper, 2 ft. 7 in. long, and 3 ft. 6 in. broad by 4 ft. 5 in. high above the fire bars. The boiler contained 86 copper tubes 8 ft. 10 in. long and 2 in. in diameter. The engine was fitted with expansion links, and had four driving wheels, each 4 ft. 6 in. in diameter. The feed pipes were telescopic, made of brass and iron. The tender tank was made of sheet iron, and capable of holding 654 gallons of water. It was carried on a wood frame with horns of malleable iron, with four malleable iron wheels, having axles 3½ in. in diameter in the middle. The tender was mounted on four springs, and was provided with a screw brake.

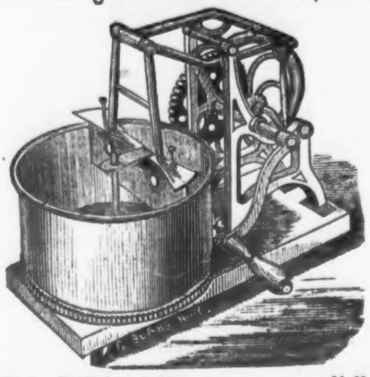
In the following year (1839) the Stockton and Darlington Railway Company ordered the building of the "London" by Messrs. Hague & Co., and the engine is worthy of note as the first which the company had built out of the North of England. The "London" may be regarded as one of the very first locomotives constructed in the metropolis for a northern railway. It had four coupled wheels 4 ft. 5 in. in diameter, the leading axle being 4 5-16 in. in diameter and the crank axle 5 in. in diameter. The boiler was 7 ft. long by 2 ft. 4 in. in diameter, and the fire box was of copper, shaped thus, D, and was 2 ft. 7½ in. long by 3 ft. 3 in. broad, and 3 ft. 7 in. high above the fire bars. It contained 71 copper and brass tubes, each 7 ft. 4 in. long and 1¾ in. in diameter. The engine had cylinders 11 in. in diameter with 16 in. stroke, and was fitted with gab motion. The tender was of sheet iron and capable of holding 491 gallons of water. It had four cast iron wheels, each 2 ft. 10½ in. in diameter, four buffers, four springs, and the brake was a long lever with two wooden blocks.

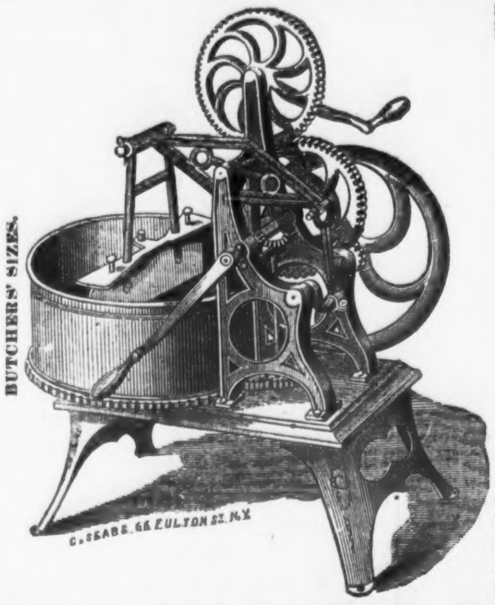
(To be Continued.)

English and American Railways.—We clip the following from a London exchange, and think it pretty good in view of the fact that the Old Colony Railroad used some of these English carriages years ago, and has never got rid of them. It is the only road in the country, so far as we know, that has ever indulged in this foolishness, and it is not in the least probable that it will have any imitators: The latest improvement in American traveling, the luxurious Pullman car, has been naturalized in England, and there seems a somewhat widespread desire to arrange railway vehicles altogether on the American system. That being so, it is rather amusing to find that the Americans are adopting our exclusive classification of passengers, so far, at least, as the Old Colony Railroad of Boston is concerned, where they have, we are told, adopted the orthodox English first-class carriages, and find them popular. One journalist praises the ease with which ingress and egress is obtained with carriages on this system compared with those of the American pattern, which have only one entrance and exit, as well as the superior handiness of the English carriages, especially for rapid local trains.

AMERICAN MEAT & VEGETABLE CHOPPER.

(FAMILY SIZES)
For the use of
Families,
Hotels,
Restaurants,
Boarding Houses, Bakeries, &c.





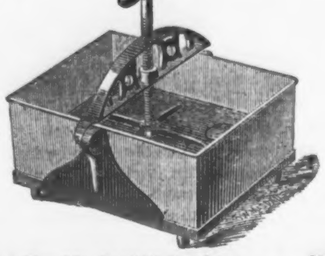
BUTCHERS' SIZES.

No. 1, Small Family Size $6 00
No. 2, Large " " 9 00
No. 2½, Hotel or Bakers' Size 12 00
No. 3, Farmers Sausage Cutter 15 00

No. 4, 15 inch Block.
No. 5, 18 inch Block.
No. 5, 20 inch Block.

STARRETT'S DOMESTIC PRESS

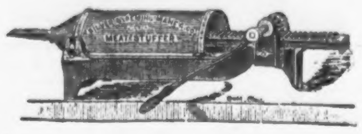
For Pressing
Corned Beef, Boiled Mutton, Tongue, Boned Turkey, HEAD CHEESE & OTHER MEATS.
And Extracting the Juice from FRUITS AND BERRIES, for making DOMESTIC WINES, GRAPE and CURRANT JELLIES, &c.



No. 1, Size 6 by 9 and 4 inches deep $3 00
No. 2, " 8 by 12 and 5 " 4 00
No. 3, " 10 by 11 and 6 " 5 00

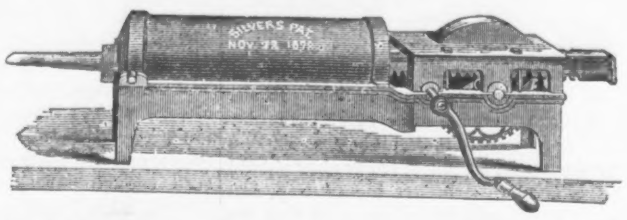
Silver's Patent MEAT STUFFERS.

(FAMILY SIZES.)



No. 1, Capacity 6 lbs $6 00
No. 2, " 9 lbs 9 00

(BUTCHERS' SIZES.)



No. 3, Capacity 12 lbs $13 00
No. 4, " 20 lbs 15 00

BAILEY WRINGING MACHINE COMPANY, Agents, 106 Chambers St., N. Y.

White Lead, &c.

John T. Lewis & Bros.,
No. 231 South Front St., PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.
MANUFACTURERS OF
PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil
AND PAINTERS' COLORS.

ATLANTIC WHITE LEAD. PURE. WARRANTED. ROBERT COLGATE & CO.

TRADE MARK.
The Atlantic White Lead and Linseed Oil Company,
MANUFACTURERS OF
White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.
ROBERT COLGATE & CO.,
287 Pearl Street, New York

Established A. D., 1777.
WETHERILL & BRO.,
Manufacturers of
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Offices, 31st. St. below Chestnut, PHILADELPHIA.

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JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

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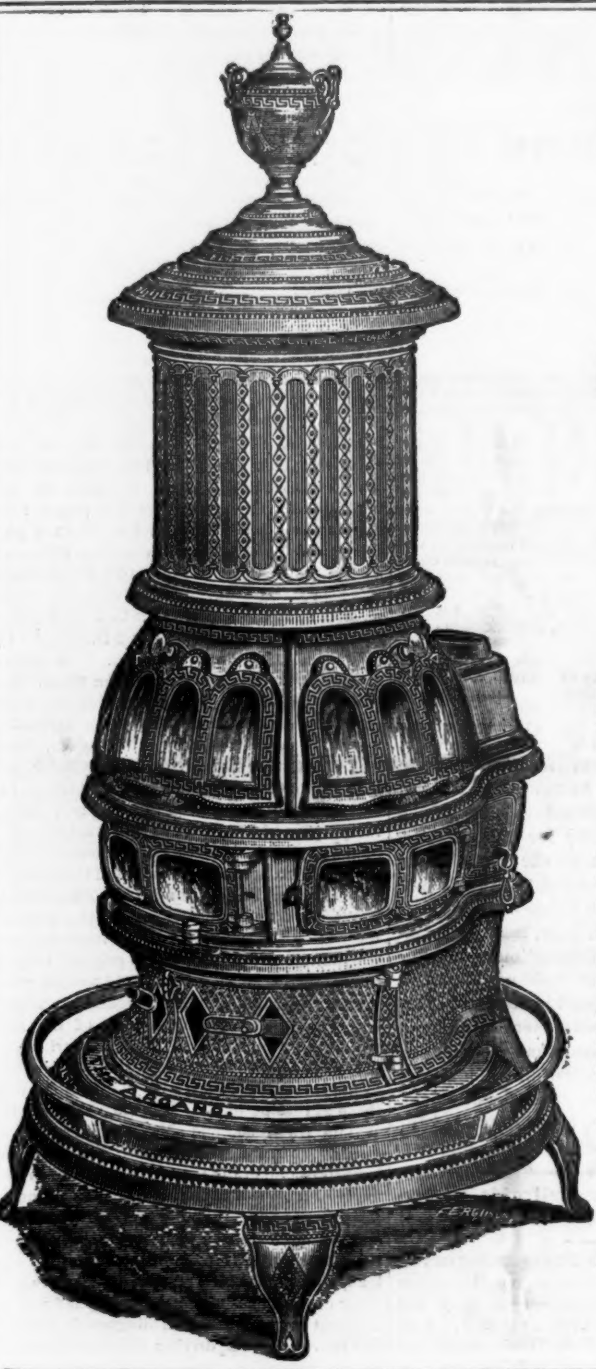

THE ARGAND Base Burner,

WITH BASE HEATING FLUES,
Patent Clinkerless Grate,
And Illuminated Base.
ARRANGED WITH
Spoor's Parlor Stove Furniture
AND THE
New Silver Plated
Foot Warming Rail.

DON'T BE DECEIVED.

As a still further proof of the SUPERIORITY and POPULARITY of the Argand over all others, such a demand was created in one season that manufacturers of base burners all over the country were obliged either to make new stoves or alter over in some way the old ones so as to combine some of the essential points and to have them in appearance as much like the **ARGAND** as possible. Some have copied so closely that a person not fully posted, seeing the Argand at one store, and some other at another, would almost vouch they were both the same stove. BUT DON'T BE DECEIVED. By careful observance you can distinguish the difference. Go on the principle that if anything is worth COPYING the ORIGINAL is always the best, and when you get the Argand you get the original.

PERRY & CO.,
ALBANY, 115 Hudson Avenue.
NEW YORK, 86 Beekman Street.
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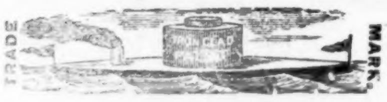
"IRON CLAD PAINT."



We manufacture under "Green's Patents," from the purest and hardest iron ores, the best and cheapest Paint in the world for iron, iron workers, bridge builders, tin roofs, woodwork, and anything where a durable paint is needed.
Send for circular and price list.

EMPIRE IRON CLAD PAINT CO., 30 West Broadway, New York.

SOMETHING NEW!

"Zero" Stove Cover Lifter.
Patented July 27th, 1875.

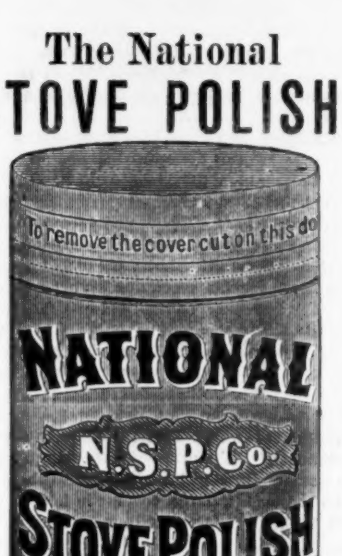
Made in one piece from a superior quality of sheet iron, with a perforated cylindrical handle. Its superior advantages over any other style of cover lifter are manifest, as it will not break or bend, keeps always cool, and will fit any stove cover made. Send for Circular.

EAST RIVER SHEET METAL MFG. CO.,
SOLE MANUFACTURERS, 253 Pearl Street, New York.

STAR CHAIN WORKS,
WHITAKER & SKIRM,
Manufacturers of
CHAINS and Chute Nails,
TRENTON, N. J.

Coil Chain.	Car Brake and Safety Chain made to any specified length.	Rake Chain.
Trace Chain.	Special attention given to	Reel Chain.
Breast Chain.	Chain for Agricultural Machines.	Drill Chain.
Halter Chain.		Stay Chain.
Cow Ties, &c., &c.		Lock Chain, &c., &c.

The National STOVE POLISH.



This Stove Polish is a strictly pure article, free from all adulteration. It will polish with the greatest ease, and give a brilliant and durable lustre.

NATIONAL STOVE POLISH CO.,
74 Pearl Street, BUFFALO, N. Y.

NEW MODEL DERINGER REVOLVER.

22 Cal. 7 Shot.
An exact model of S. & W. No. 1 Revolver.

This arm is Half Nickel Plated, and is equal in style of finish to the best arms in the country. Quality of workmanship and material first-class, and guaranteed in every respect.
Price less than any other Hinge Barrel Cartridge Revolver in the market.

Sole Agents, EDWARD K. TRYON, Jr. & CO., Dealers in FIRE ARMS.
No. 19 North Sixth Street and No. 220 North Second Street, PHILADELPHIA.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,	Ring Bush Hooks,
Butchers' Choppers,	Axe Eye Bush Hooks,
Axes and Hatchets,	Socket Bush Hooks,
Grub Hoes and Mattocks,	Watt's Ship Carpenters' Tools,
Mill Picks,	Carpenters' Drawing Knives,
Box Chisels and Scrapers,	Coopers' and Turpentine Tools.

FOR SALE BY
N. WEED, 4 & 6 Gold St., N. Y.

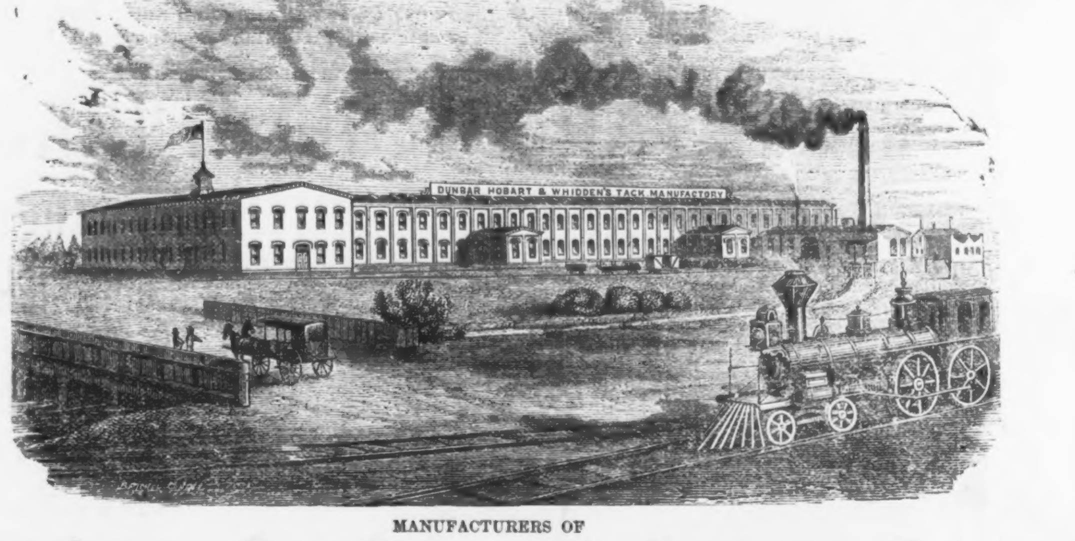
HOBART'S TACKS.

MANUFACTURED BY

DUNBAR, HOBART & WHIDDEN,

Established 1810.

Office and Salesroom, 116 Chambers Street, New York. Factory, South Abington, Mass.



MANUFACTURERS OF

American, Swedes and Copper Tacks,

Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners', Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points,

IRON, STEEL, COPPER, ZINC AND BRASS SHOE NAILS,

Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails.

A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and irregular sizes made to order or cut from sample at short notice. Send for Price List.

HISCOX FILE MANUFACTURING CO.

WEST CHELMSFORD, MASS.

FILES & RASPS

OF EVERY DESCRIPTION, ALSO ALL KINDS OF

MACHINE — RAG
MOULDING — STRAW
VENEERING — PAPER OR
LOGWOOD — TRIMMING

KNIVES

ADDRESS HISCOX FILE MANUFACTURING Co

WEST CHELMSFORD, MASS.

AMERICAN LOCK MFG. CO.,

Manufacturers of

FELTER'S

Locks & Latches,

Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with

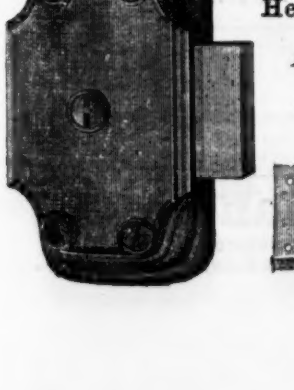
SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, ***and cannot be affected by rust***, and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, ***they will rival the best made Locks in Finish and perfect operation.***

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having ***thirty-five*** finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs which cannot be said of any other patent Tumbler Locks in use.



THE LOCKS ARE FITTED TO THE KEYS,

And not the Keys to the Locks.

Hence Counterfeit Keys cannot be made.

For descriptive list and terms, address

AMERICAN LOCK MFG. CO.,

OFFICE and WORKS, Cazenovia, N. Y.,

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Peck & Snyder's Patent

SELF-ADJUSTING AMERICAN CLUB SKATE

After the severest tests for the past three years, these skates are now admitted to be the only practical **Self-Adjusting Skates in Market.** The clamps are first adjusted to the shoe by turning the thumb-screw D when the lever C is in the above position; when once adjusted, place the skate on the foot, close the lever C, and the skate is securely fastened to the foot. By the action of the clamps, the skate is always in the center of the foot, and cannot slide from side to side as in other clamp skates. They require no heel plates, key or wrench.

PRICE LIST. Per Pair.

No. 1.—With Blued Footplate, and Runners the same as the best $5 00

No. 2.—Same as No. 1, only nicely Nickel Plated, effectually prevents the skate from rusting 6 00

No. 3.—Same as No. 2, only before the Skate is put together, each part is finely Polished and heavily Nickel Plated, the finest skate ever offered 8 00

A special discount to the Hardware Trade. Address

PECK & SNYDER, Manufacturers,
No. 126 Nassau Street, N. Y.

Commercial Failures Since January 1.

Messrs. Dun, Barlow & Co. send us the following report for first three quarters of the current year, under date of Oct. 20, 1875:

The following tables show the number of failures which have occurred throughout the United States and Canada for each of the three quarters of the current year, together with the amount of liabilities:

States and Territories.	1st 3 Months. Number of Failures.	1st 3 Months. Amount of Liabilities.	2nd 3 Months. Number of Failures.	2nd 3 Months. Amount of Liabilities.	3rd 3 Months. Number of Failures.	3rd 3 Months. Amount of Liabilities.	Total for 9 Mos. Number of Failures.	Total for 9 Mos. Amount of Liabilities.
Alabama	15	$366,000	5	$157,000	2	$20,000	22	$543,000
Arkansas	6	76,000	12	124,000	2	21,000	20	221,000
California	61	673,971	55	1,831,699	49	626,441	165	3,124,111
Colorado	20	294,902	14	71,200	19	197,300	53	562,402
Connecticut	43	352,661	36	559,393	62	1,456,515	141	2,368,569
Delaware	5	65,000	9	59,200	1	30,000	15	154,200
District of Columbia	5	28,824	9	58,100	2	53,000	16	139,924
Florida	7	180,000	4	59,000	1	2,800	12	241,800
Georgia	65	1,897,300	47	2,139,830	11	271,300	123	4,318,430
Idaho Territory	1	3,000					1	3,000
Illinois	107	2,377,718	74	1,862,400	96	1,783,852	277	6,013,970
Indiana	80	1,615,349	65	391,534	91	1,617,129	236	3,654,012
Iowa	54	320,505	26	201,100	51	493,200	131	1,014,805
Kansas	17	73,800	10	155,500	30	314,000	57	543,400
Kentucky	38	1,150,000	47	1,171,300	21	261,000	106	2,582,300
Louisiana	8	395,831	8	17,653	8	289,000	24	702,484
Maine	32	339,000	23	315,000	35	250,000	90	904,000
Maryland	45	780,415	24	317,700	16	8,226,551	85	9,324,666
Massachusetts	227	6,816,800	150	4,039,700	187	4,771,821	564	15,628,321
Michigan	60	511,041	50	753,864	62	1,225,749	172	2,490,652
Minnesota	38	250,050	41	562,135	30	551,075	109	1,363,260
Mississippi	22	435,608	5	306,400	2	71,457	29	813,465
Missouri	51	1,054,331	54	1,119,062	40	552,400	145	2,725,793
Montana Territory					1	35,000	1	35,000
Nebraska	18	120,100	6	41,000	5	15,300	29	176,400
Nevada	9	205,800	7	65,300	7	140,600	23	411,700
New Hampshire	17	113,400	18	169,200	22	531,300	57	890,900
New Jersey	12	97,758	14	218,500	51	1,577,845	77	1,894,103
New York	171	3,736,801	104	1,942,939	201	2,795,117	476	8,474,857
New York City	197	8,490,500	138	6,277,000	211	16,983,850	546	31,696,350
North Carolina	14	123,029	25	283,400	8	265,000	44	671,429
Ohio	86	1,482,974	75	1,188,737	99	2,011,623	260	4,683,334
Oregon	5	88,939	1	114,009	2	7,500	8	210,448
Pennsylvania	155	5,423,828	133	3,693,858	131	3,992,197	419	13,003,883
Rhode Island	22	476,394	21	303,200	16	216,000	59	995,594
South Carolina	61	989,136	50	1,053,336	7	511,946	118	2,554,518
Tennessee	24	139,985	30	231,763	29	237,075	83	608,748
Texas	69	660,100	47	493,000	77	722,539	193	1,876,239
Utah Territory	2	44,000	1	9,500			3	53,500
Vermont	15	136,700	17	160,000	11	175,800	43	472,500
Virginia and West Virginia	37	456,065	25	341,251	28	683,451	90	1,480,370
Washington Territory	1	2,804					1	2,804
Wisconsin	57	419,284	94	752,719	47	351,024	198	1,523,027
Total	1,982	$43,176,953	1,581	$33,667,313	1,771	$54,328,237	5,334	$131,172,503
Dominion of Canada	396	$4,141,340	432	$7,876,104	741	$9,891,100	1,569	$21,911,544

Owing to the fact that this is the first year in which quarterly returns of failures have been compiled, it is impossible to institute an accurate comparison with similar periods included in the above figures. But with the total failures of previous entire years before us, divided by three-fourths, a comparative result is reached, which will be sufficient for all practical purposes:

	Total Failures for Year.	Three-fourths of Same.	Total Liabilities for Year.	Three-fourths of Same.
1872....	4,607	3,050	$121,056,000	$90,794,000
1873....	5,183	3,887	228,499,000	171,374,000
1874....	5,830	4,371	155,239,000	116,429,000
1875, Nine Months		5,324	Nine Months...	131,172,000
Average for 9 Months of 4 Years.		4,160	Average for 9 Months of 4 Years......	127,442,000
Excess in No. of F'l'res for past 9 Mos....		1,174	Excess of Liabilities for past 9 Months	$3,730,000

In New York city the failures for the past nine months number 546, the liabilities amounting to $31,000,000. Referring to the same number of months in previous years, we find the failures in 1874 were 483, with liabilities of $24,000,000; in 1873 the failures in the nine months were 498, with liabilities of $69,000,000; and in 1872 the number was 315, with liabilities of $15,000,000. Taking the average of the nine months in four years, the result is 460 failures, with average liabilities of $35,000,000. So that, though the above figures for New York look somewhat startling, their comparison with the average of years indicates that they are not very excessive. It must also be borne in mind that, included in the failures of the past quarter, there were a few of exceptionally heavy character—four concerns alone in New York city aggregating liabilities of over eight millions of dollars. This fact also more than accounts for the increase in liabilities resulting from the failures for the entire country, as shown in the above comparative table. The increased number of failures, however, not only in New York, but in numerous sections of the country, is an important indication of the pressure of the times, and, if not accounted for, may create some apprehension as to the future.

While the figures presented above wear a discouraging aspect, it must not be forgotten that these failures are largely the result of previous misfortunes, with which the trade of the past three months is not chargable. The effects of the panic of 1873, or rather of the excesses of which that was the climax, are seen in a great number of the casualties included in the foregoing figures. Certainly the increase in the amount of the liabilities is traceable to the attempt, on the part of some of the heaviest houses who have succumbed, to float themselves along by increasing their obligations, and otherwise postponing the evil day, in the hope of a revival of business and a return of better times, when their assets would become more realizable. Then it must be borne in mind that just such a period as this tests very severely the stability of all whose affairs are at all expanded, while those whose claims to credit rest only on previous reputation, and who have only the shell or poor remains of lost or diminished fortunes, are utterly unable to withstand the searching, realizing spirit of the day. The times are unfavorable to such as these, and the consequences are to be seen in a largely increased list of failures and heavier liabilities than in the average of years. Departure from legitimate business principles, perhaps in former years, or even of more recent occurrence, is the cause to which not a few of the failures of the last quarter can be traced, and these results are more properly chargeable to the indiscretions of individuals, or their want of judgment, than to a disorganized or unsafe condition of trade.

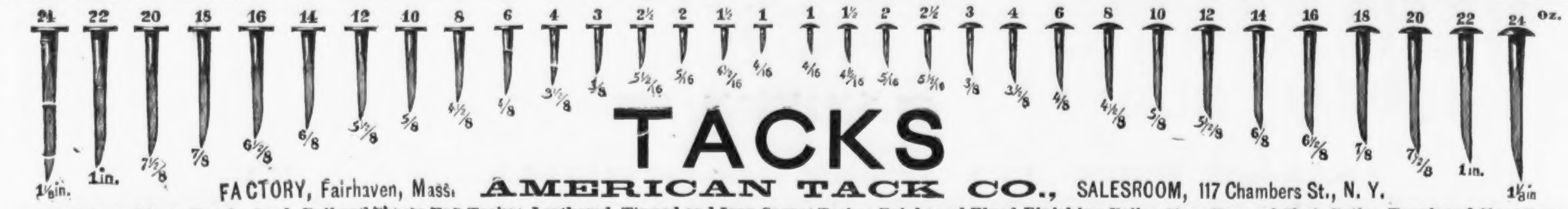
The above considerations may, in some measure, account for the increased number of failures—still, there is no denying the fact that the reduction in the volume of business, the seeming impossibility of largely reducing expenses, and, above all, the enormous number engaged in business, in proportion to the trade to be done, even in the best of years, and which periods like the present "weed out" most effectually—these are causes for an increased failure list, which may be justly attributed to the pressure of the times. But, after all, it may be doubted if this process is an unmixed evil.

While the above figures seem to indicate a much worse condition of affairs than was supposed to exist, it is apparent that the disease with which the commercial community is affected has been one of slow development; and it by no means follows that, because the symptoms are now becoming more marked than formerly, the recovery of the patient is any the more remote. On the contrary, there are many indications of returning health and vigor. Chief among the hopeful signs of the times is the disposition to rapidly realize upon the abundant crops which have been so successfully harvested, and which must greatly increase the purchasing and debt-paying power of a large class of the community. In anticipation of this movement in crops and currency, a very fair trade has been done at almost all jobbing centers, and though business by no means attains its former volume or profitableness, the results of the autumn trade are in the main encouraging.

It is true that numerous interests remain depressed; that capital continues timid and hence idle; that many manufactories are only partially employed; that some staple articles of merchandise show no profit, while others can only be sold at a loss; and that there is much which prevents a hopeful view of business matters. But, as compared with the condition of things at this date last year, there is certainly an improved prospect. Notwithstanding the figures presented above, the year has been by no means one of disaster, and, though the process seems a slow one which leads on to prosperity, it is none the less a sure one.

That this is a general conviction in the minds of distributors of goods is best evidenced by a tendency which, while it is encouraging, is none the less dangerous. We refer to the gradual increase in the time of credit given, and the great advance in the amounts granted. An undue expansion of credits for the purpose of inducing business is an evil policy at any time, but it is peculiarly so, when economy, restricted trade, and gradual reduction of existing indebtedness should be the features of the hour. Cheap credit is the sure precursor of disaster; and, while the strongest element in the financial fabric in these trying times has been the small indebtedness, it is not difficult to see that, if the lines of credit become lax, in time, amount or character, all that now promises favorably will only contribute to hasten an unhealthy and an unsafe condition of business. If, on the contrary, a wise conservatism is practiced in this respect—if the standard of credit is elevated rather than lowered, and a rigid scrutiny made into the claims of all who seek it—the prosperity for which all pray will come as soon, and be far more likely to stay when come it does.

The results of indiscriminate credit and unwise expansion in the wrong direction are illustrated by the condition of things in Canada, as shown by the figures included in our tables. Two years ago the trade of the Dominion was in the highest degree prosperous and safe; the progress of all its leading towns was remarkable, and apparently based on the soundest principles. But largely increased bank capital, inducing liberal loans; heavy importations, necessitating free sales to weak people, and a general cheapness of credit, have, in an incredibly short time, brought about a result as startling as it is suggestive. From the figures which we furnish it will be seen that, in the last nine months, the failures in Canada have been 1569, with liabilities of nearly $22,000,000. This, in 50,000 traders reported in the Dominion, implies that thirty in every thousand traders have succumbed to the pressure, while in the United States the figures show in the same period only eight failures in every thousand traders. Of course, the solid prosperity of the great body of the people of the Dominion is undoubted, and already good progress is being made toward recovery in the health of its trade, but the figures we herewith present teach the lesson that expansion in unwise credits is most delusive and dangerous.



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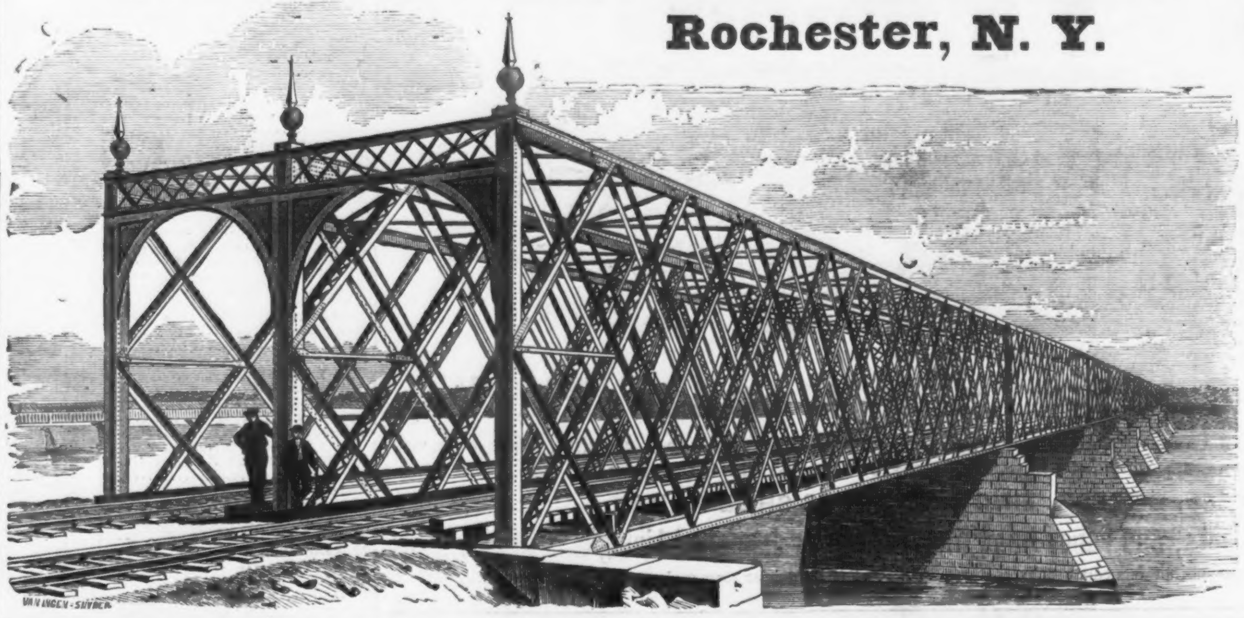

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[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

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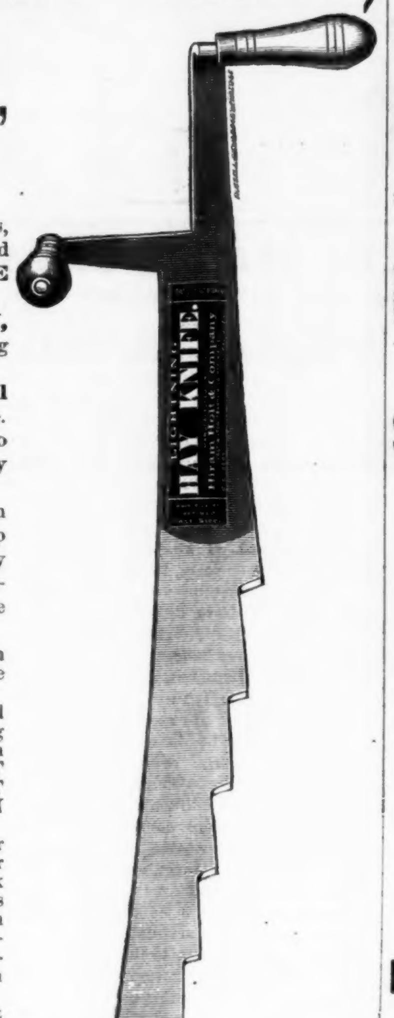

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The blade of this knife is **Solid Cast Steel** of such strength and temper as the tests require. It has the **Spear Point,** which enables it to enter the substance to be cut easily and in any direction desired.

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The cutting surface being small it is kept in order much easier than the old smooth edge knife.

The handles (as seen in the cut) are so arranged that the operator can stand erect, and, having the use of both hands in applying his strength directly upon the knife, can, with ease, CUT TWO FEET IN DEPTH, AND TEN FEET IN LENGTH IN STACK OR MOW, IN ONE MINUTE.

It is not only valuable as a Hay Knife for dividing stacks and mows, but is a superior instrument for cutting hay from the bale, stack or mow, and corn stalks into fine feed, thus doing the work of hay cutters much faster than any other hay cutter in use. It also stands unrivaled by any implement yet invented in cutting peat, turf and muck, and ditching in marshes and meadows.

This knife, although a late invention, is fast taking the place of all other hay knives, and only requires testing to be adopted as the only hay knife which gives

PERFECT SATISFACTION.

It has received several first premiums and medals at the New England State Fairs, among which is a **Silver Medal** from Maine State Fair, 1874.

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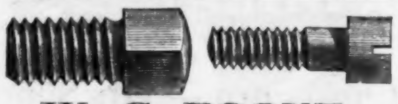

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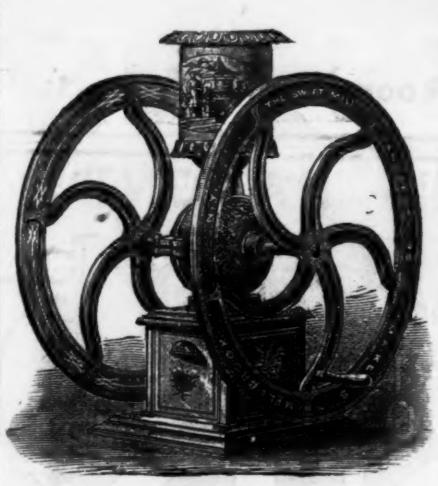

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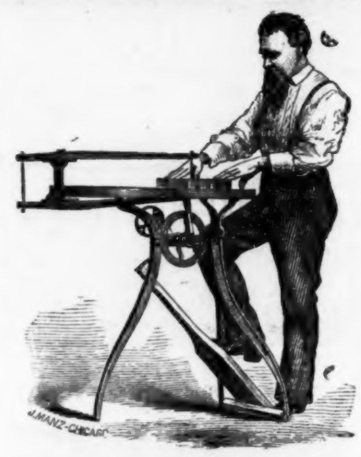

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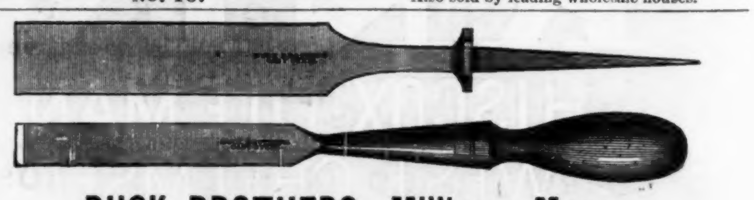

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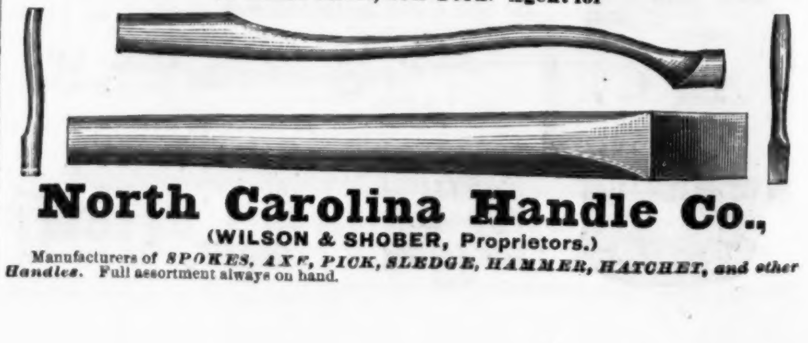

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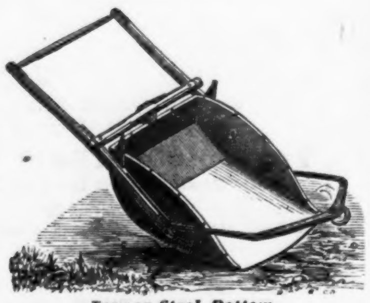

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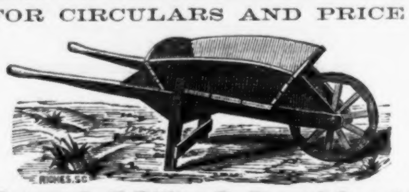

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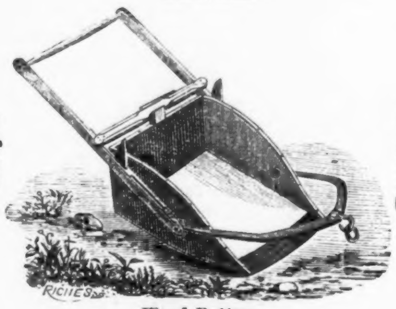

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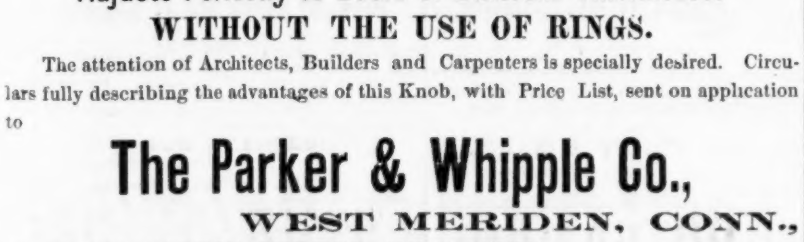

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WITHOUT THE USE OF RINGS.

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FOR NIGHT DRIVING,

throws a powerful Light 100 feet ahead of the horse. Burns Kerosene without a chimney for 10 hours after one filling.

Fits any shaped Dash or on any vehicle. Splendid Barn Lantern;

Also good for Deer Hunting.

The light is not affected by wind, rain or jolting. No person should be without one.

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MANUFACTURED FOR

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Warranted to weld and to harden, and to be equal, if not superior, to any made.

THE COWLES HARDWARE COMPANY,

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A New Metal.

Gallium is the name given, "in honor of France," to a new element which has been discovered by M. Lecoq, an amateur *savant*, of Bois-Baudran, Cognac. The celebrated chemist, Wurtz, presented to the Academie des Sciences, in its sitting of September 20th, a note on the part of M. Lecoq, announcing the discovery, particulars of which had been communicated under seal as far back as August 27th. This new element has not yet been isolated, and has not therefore been seen by any one; its physical characteristics remain so far unknown. It is an analogue of zinc and cadmium, of which metals it is an alloy, and was found in a blende from Pietrafita, Spain. The forms under which it is known, so far, are those of the chloride and sulphate. The discoverer is a student of the phenomena of the spectroscope, and it was in the course of his observations that the new metal presented itself, its character being revealed by a spectrum which no simple body had ever given. Two lines, one much brighter than the other, both situated in the violet—the region occupied by the brightest lines of the zinc—were noticed, and the place of the former line being at the 417th degree of the scale of lines, and the other at the 404th. The affinities which gallium has with zinc are declared by chemical analysis as well as by its spectrum. Like zinc it is not thrown down from solution in hydrochloric acid by sulphureted hydrogen; and preserves its analogy with zinc by being precipitated by the same gas from an acetic acid solution. Under these conditions it is obtained before the zinc, and on fractionation, the two are got separately. Like zinc, the new metal gives a white precipitate with the sulphide of ammonium. On immersing a piece of zinc in a solution of the new metal it separates and comes out, not in a metallic form, but under that of an oxide, precisely as aluminium does under similar circumstances. The analogy with aluminium, however, is not long sustained, for if a small dose of ammonia precipitates the gallium, an excess re-dissolves it. Up to the present time only a very small quantity of allium has been obtained, but M. Wurtz, who presented the paper, has given the Academy tubes of solution for experiment; and on asking for a commission to examine into the question and to place gallium on the list of simple bodies, the Academy named M. Wurtz himself, joining with him M. Fremy. The actual number of known elements is 63, 47 of which are metals and 16 metalloids. If the new element takes the place claimed for it, France will have obtained an honor equal to that of England, which discovered thallium, and approximative to that of Germany, the discoverer of casium and rubidium.

The Cowles Hardware Company.—This establishment, situated at Unionville, Conn., manufactures a variety of hardware, among which may be found butchers' cleavers, cake and fish turners, vegetable slicers, carpet stretchers, butter spuds, awls, &c. They make a specialty of screw drivers, of which they manufacture for the trade four different grades, the difference being only in the shape and finish, the quality of the steel being the same in all. It is the intention of this company to make these goods a standard article, and to keep their excellence up to the highest degree. Owing to their superior facilities for their manufacture, they are prepared to supply screw drivers of any shape, size or quality to manufacturers of sewing machines, implement makers, and any branch of business requiring a screw driver especially adapted to a particular class of work. Among the house furnishing goods manufactured by them, their mincing knives are worthy of mention. In this line of goods they claim to be the oldest concern in the country, having been established as early as 1835. Their patent automatic mouse traps are commendable for their cheapness, simplicity and ease of management—a child, even, setting one without difficulty.

The largest hotel in the world is said to be the Palace Hotel, at San Francisco. The building is nearly finished, and was opened on October 1. It is 350 ft. long by 275 ft. wide, and is seven stories high. The architecture is peculiar—no large columns, no domes, no arches, no pinnacles—nothing but bay windows! Every room fronting on the street has one. The entrance is in New Montgomery street through a *porte cochere* extending to a court 144 ft. by 84 ft., reaching to the top of the building and covered with glass. In this court will be walks, fountains, statuary, and tropical plants. On every floor a verandah, 12 ft. wide, extends entirely around the court, forming a promenade above the garden, which is to be illuminated in the evening. There are nearly 1000 rooms in the hotel and 500 bath-rooms. No room is less than 16 ft. square, and more than half are 20 ft. square. Every room has a closet, a fireplace, a French mirror, a marble mantel 6 ft. long, and standard gaslights. The hight of the first story is 27 ft. 3 in.; of the second, 15 ft. 9 in.; third, 14 ft. 7 in.; fourth, 14 ft.; fifth, 13 ft. 6 in.; sixth, 13 ft. 6 in.; seventh, 16 ft. 6 in. Twenty-eight miles of carpet of ordinary width will be required to carpet the hotel. The principal dining room is 150 ft. long. The building is of brick and iron, and is considered perfectly fire-proof. The hotel and ground have already cost $5,000,000. The furniture will cost $1,000,000; the mirrors, $100,000; the chandeliers, $45,000; the silver, $60,000; the linen, $75,000. Mr. Sharon, the rich senator from Nevada, is the sole proprietor.

The Greenwood Iron Works.—These works are located at Greenwood, Orange county, N. Y., on the Erie Railroad, about 40 miles from New York city, in one of the most picturesque portions of the country. The proprietor, Mr. P. P. Parrott, owns at this place 10,000 acres of land, rich in deposits of magnetic ore, from which he obtains all the iron he manufactures. In these days of centennial celebrations, to this establishment is due the honor of having seen more than a hundred years, it being among the earliest manufactories of American iron. It was here that some of the first guns used in the revolutionary war were made. In 1854 an anthracite furnace was established where the celebrated "Clove" anthracite pig iron has since been manufactured. The capacity of the present works for making charcoal iron is about 40 tons per week, and of anthracite iron 200 tons.

Practical Observations Upon the Puddling Process.

BY J. M. BURTON.

Having obtained a practical knowledge of the subject by actual work at the furnace, I feel myself at liberty to offer a few observations upon the important subject of puddling.

Although the present "puddle furnace" seems of the simplest and most natural construction, it passed through many curious changes before it attained its present form. Those who have any curiosity on the subject will find quite an interesting and full account of the early patents in Dr. Hermann Wedding's new work on puddling, contained in his "*Ausfuehrliches Handbuck der Eisenhuttenkunde*" (page 114).

I will not undertake to describe or speak of any but the well known hand-puddle furnace, as the attempts to lessen or do away with the same, on the score of expense, by mechanical contrivances have not been so far successful as to promise general introduction. The puddling furnaces in general use in this country may be briefly described as follows.

EXTERNAL APPEARANCE.

In appearance the puddling furnace resembles a long iron chest, averaging say 12 ft. long by 5½ high, with a short flue about 6 ft. long, declining rapidly from the roof of the furnace to the bottom of a tall chimney. Near the center of the furnace is a plate door, lined with fire brick, about 2 ft. square, kept in place by a bar and wedge, and raised by means of a chain and lever. In the bottom of this door is an opening 4 by 6 in., called the "working door," through which the tools are inserted when working the metal. Near one end of the furnace is another opening, about a foot square, with projecting shelf at the base, called the "Fire Hole," through which the fuel is introduced. This is closed simply with coal.

THE INTERIOR OF THE FURNACE.

First we have the "fire place," some 3 ft. square, with slightly arching roof. The depth and character of the grate depends entirely upon the nature of the fuel. With bituminous coal it has, as stated, a depth of some 3 ft. from the roof, and about one from the base of the "fire hole;" the grate is formed by plain movable bars resting on two or three supports. Next to the fire place comes the "hearth," or what might be called the "working furnace," a circular space, some 3 ft. by 4, the sides of which are composed essentially of large pieces of iron ore (magnetic and Missouri ores the best), with the space filled in with ground ore and fire clay. Spaces are left on both sides for the flame to enter and depart over what are called the "fire" and "flue bridges." The bottom or "hearth" should be perfectly smooth, and formed by the melting of wrought iron scrap. This is renewed at the end of each day's work. The roof of the entire furnace is gradually inclined toward the flue, sinking more rapidly after passing the working furnace.

The proper construction of the furnace is of the greatest importance as affecting the production of good iron, and it requires to be kept in perfect repair, otherwise the amount of heat and character of the flame get beyond the puddlers' control, and, as follows naturally, the character of the product is uncertain, causing both waste and a "raw iron." Another too frequently neglected feature is in the coal, for although one can puddle with fine or "slack" coal, we do not want dust, nor, what is worse, dust soaked with rain.

A furnace should never be allowed to become perfectly cold, as the contraction of the fire brick lining is, of course, very great, causing cracks and soon necessitating repairs.

The great advantage that puddling has over all other refining processes is in the fact that a better product can be obtained from an equally impure pig. This is especially true in regard to the "boiling process," which aims at the production of a soft, fibrous, but very tough iron, called wrought or malleable iron. As this boiling of iron includes the puddling of iron and steel, and being myself more familiar with this process, I shall dwell on it more at length.

"Boiling" is always carried on in "merchant mills," while "puddling" is confined to "rail" and "steel mills."

Notwithstanding the fact that nine tenths of the workmen and superintendents engaged in the manufacture of iron are lamentably ignorant of all scientific principles connected with their business, and are yet able to turn out good iron, I think it will be a matter of some interest to give a brief description of the physical appearance of the operations at the furnace, and will therefore examine concisely some of the most frequent occurring constituents of pig iron as it comes from the blast furnace:

Percy.

	Symbols.	Gray pig. per cent.	White pig. per cent.
Iron	Fe	90·24	89·86
Carbon	C	3·05	3·31
Silicon	Si	3·06	1·12
Manganese	Mn	0·83	2·72
Sulphur	S	1·14	2·00
Phosphorus	P	0·93	0·91

Carbon, undoubtedly, holds the first place in importance, as without that element the iron would be useless for commercial purposes. Eminent chemists have endeavored from the earliest times to discover a fixed union between carbon and iron, but, as Karsten declared, after investigations continued through twenty five years, there seems to be no such compound, which opinion is strongly confirmed by Percy. Karsten has, however, left us two formulæ, which are still accepted by the best authorities as being the most satisfactory, and expressed by Gmelin, as "iron completely saturated with carbon, Fe_4C" (white pig), and, "iron combined with a portion of the carbon, FeC_x" (gray pig). In other words, carbon in the chemically combined and in the mechanically diffused state (as graphite). The discussions on this subject are most interesting, but so diffuse that I am at a loss at present how to reduce them to the limits of this article. "Spiegeleisen," the most highly carbonized and the purest of all the white irons, was first represented by Fe_4C, but owing to the rare absence of large amounts of manganese, the formula has been changed to $(FeMn_4)C$. Kerl, however, in his late work, *Grundriss der Eisenhuttenkunde*, does not consider manganese a necessary constituent of spiegeleisen.

The degree of hardness of iron is dependent upon the percentage of carbon present in the combined state, and the above mentioned species is able to scratch glass and steel, allowing itself to be pulverized. Karsten gives the limit of carbon as 5·93 per cent., but most modern authors are content with 5·00 per cent. Its source is from the fuel used in the blast furnace, which comes in contact with the iron when in a state of fusion.

Silicon comes next to carbon in importance, and never occurs in the free state, either in nature or in pig metal. In nature it is found united with two atoms of oxygen to form silica (SiO_2), which is best represented by quartz sand. In the pig it appears partially as silica, and partially as silicide of iron. Its source is from the silica contained in the original ores, and from that in the fuel of the blast furnace. The value of silicon is its readiness to oxidize to silica, which, uniting with a portion of the iron, forms a cinder or slag that not only absorbs many of the impurities of the metal, but also removes the excess of carbon. It forms two important silicates of iron, called the bisilicate, with the formula $FeOSiO_2$ or Fe_2SiO_3, and the normal or mono-silicate 2 FeO_3 SiO_2 or Fe_2SiO_4. Both of these formulæ we shall have occasion to frequently repeat.

Silicon is only useful as a mediator or carrier of oxygen to the other constituents, as it is very injurious in all the finished products of pig iron, except when present in very small quantities. It has, however, a neutralizing effect upon the injurious influence of phosphorus when present in steel, owing rather to the fact of its partially taking the place of carbon, thereby allowing a low percentage of carbon, than because of any chemical reaction in the phosphorus.

The great heat engendered by its oxidation to silica renders it an important ingredient of Bessemer pig. I subjoin a table of comparison to better illustrate the above assertion:

1 Equiv. of Si to SiO_2 gives	6382 heat units.		(Jordan).
1 " C to CO "	2172 "		(Jordan).
1 " Fe to Fe_3O_4 "	4134 "		(Andrews).

Next in order comes manganese, which, in respect to the boiling process, certainly must be placed under the head of impurities, but it is the very soul of steel manufacture. Manganese is rarely found in gray pig, as the presence of only a small amount will convert the carbon from the free into the combined state. It forms, as it were, the radical of spiegeleisen, and is present in large percentages (4 to 6 per cent., and often 12 per cent., and exceptionally 20 per cent.) Petzholdt gives, in an analysis of the celebrated ores of Southern Spain and Algiers, manganese, 16 per cent.; iron, 33·78 per cent. Percy gives in Franklinite iron, 20 per cent. The great office of manganese is in delaying or preventing the removal of carbon, which follows from two causes, viz.: it forms, with the silica, a silicate of the proto-oxide of manganese, which forms a slag that cannot dissolve the great decarbonizing agent, magnetic oxide (Fe_3O_4); secondly, the slag is very thin and liquid, which protects or covers the iron from the action of the oxygen of the air.

Sulphur occurs in the pig as a sulphide of iron (FeS), and arises principally from the impurities in the ore and fuel used in the blast furnace. Sulphur and phosphorus are the great enemies of all iron manufacture, and according to Wedding, 0·6 per cent. of sulphur renders the pig iron useless for the production of wrought iron, and a far less percentage for the puddling of steel. In the Bessemer process it is removed still less; for the best quality of steel it must not exceed ·01 per cent.

Sulphur is removed by oxidation, and escapes in the gaseous form as sulphurous acid (SO_2); partially, also, though in a much less degree, as a sulphide, in the cinder, under the squeezers and rolls. The same squeezer cinders which gave me, on analysis, a formidable amount of phosphorus, showed little more than traces of sulphur. Sulphur is removed very slowly, and only when exposed to a very high temperature for a considerable time.

Sulphur is the cause of the well known "red shortness" in bar iron, which is tough and fibrous at ordinary temperatures, but brittle at a low red heat. It can, however, be safely worked at a higher temperature. The tendency of both sulphur and phosphorus is to drive the carbon into the combined state.

Phosphorus is unquestionably the most injurious of all the constituents of pig iron and the most difficult to remove, and it is in reference to the removal of phosphorus that the hand puddling has such a great advantage over other methods. It is not known satisfactorily in what form phosphorus is removed, though it is considered to be principally due to oxidation to phosphoric acid (PO_5), which, uniting with the iron forming at a low temperature, a phosphate of the proto-oxide of iron ($2\,FeO,PO_5$). This, according to Percy, can be removed in the cinder. It can also be somewhat removed under the squeezers and rolls, as a phosphide of iron (Fe_3P). The requirement of a low temperature for the removal of the phosphorus causes the necessity, in the Bessemer and Siemens-Martin processes, of using only pure pig metal. Similarly, in the blast furnace, *all* the phosphorus contained in the ore and fuel is reduced into the iron as a phosphide.

Phosphorus is the cause of what is called "cold-shortness" in iron and steel; that is, a brittleness at ordinary temperatures. The boiling process has another advantage in the fact that the "cold-shortness" decreases with the removal of carbon, so that a good quality of wrought iron may contain 0·75 per cent. of phosphorus, while one richer in carbon only 0·5 per cent. In steel, the outside limit is 0·05 per cent., while 0·002 or 0·003 per cent. perceptibly lessens its resistance to blows. Percy gives a rather curious statement of Janoyer, who claims that phosphorus aids in the removal of sulphur, he having been able to produce a neutral iron by use of ores which contained 0·2 per cent. of phosphorus from an otherwise red-short product.

White pig iron may be distinguished from the gray by the fact of its carbon being in the chemically combined state, as well as in larger percentage. White pig is not generally as pure as the gray, owing to the presence of sulphur and phosphorus.

With regard to the boiling process, it is rarely ever used alone, as it does not generally contain sufficient silicon (·01 to 1·0 per cent.) to form the refining slag. It is also apt to lose its carbon too quickly, so that the particles weld together before they are properly refined. One or two pieces of white pig can be advantageously used with a charge of gray pig, as the latter generally contains more silicon (2 to 3 per cent.) than is necessary for the proper slag. Kerl gives the melting point of white iron at from 1500° to 1600° C.; gray at 1600° to 1700° C., and wrought iron at 2000° C., a temperature which is barely obtainable in the puddle furnace.

(To be Continued.)

Raising Perry's Flagship.

The following facts of interest in regard to Perry's flagship, the Lawrence, are from the Cleveland *Plaindealer*:

After the Lawrence had become disabled in the battle of Lake Erie, it will be remembered that Perry left her during the engagement, and made the Niagara his flagship until the close of the fight. The Lawrence with great difficulty was gotten into the port of Erie, the port at which she was built, and after rounding the peninsula, floated up Misery bay unmanageable. The next year, 1814, she was refitted and sent against the forts at Mackinac. Proving unseaworthy from the terrible drubbing of the English the year previous, she was brought back to Erie and sunk in Misery bay, and has lain there ever since, doing duty as a house for the numberless black bass which could always be caught among her timbers, and a point of interest to be visited by curiosity hunters. Enough "Flagship Lawrence canes" have been sold to build four such vessels, beside the real canes, etc., that have been made from her timbers. The vessel was built by Daniel Dobbins, whose widow now lives, or did live, a few years ago, in Erie, and who, while her husband was getting out timbers, etc., for the fleet, boarded Commodore Perry and his staff. When the writer of this saw her last, in 1871, she was a smart old lady, 94 years old, and bid fair to live to 100. We quote from the Erie *Dispatch*:

The glory of one of the chief points of interest in the harbor of Erie—that which hung around the place hallowed by the remnants of Perry's victorious flagship, the Lawrence—has departed. Her remains have been lifted from their quiet resting place under the waters of Misery bay, and carried shoreward to the edge of the peninsula, bringing to view the historic relic.

The removal is looked upon with disfavor by the majority of our citizens, and it is not to be wondered at, as the Lawrence had been lying there so long that she was accounted public property, and in the summer time was visited by hosts of strangers—the framework on one side being visible—to whom, as well as to our own citizens, it was an object of greater interest.

The remains are a queer looking mass. The port side has been cut down nearly to the keel, planking having been torn off and ribs sawed off by those who thought it was no harm to steal a piece of wood off the Lawrence, and this has been kept up until, at least, a third of her bottom has gone. The Lawrence lay on her starboard side, and that side is therefore tolerably whole to the deck beams (upper works all gone years ago), and the timber is, in general, sound and in good condition, but is a purplish black—the result of the action of the water.

Of the twenty-seven killed in that naval engagement twenty-two were killed on the Lawrence, on board of which was the intrepid Perry, whose monument ornaments our public square. The Lawrence was 100 feet long, 28 feet beam and 9 feet depth of hold. In her time she was a model war vessel, but in these days of iron clads, monitor rams and heavy armament she would not last as long in an engagement as a yawl boat in a hurricane. She fulfilled her mission, however, and gave our English cousins cause to remember her contemporary and Perry's famous victory.

Special Notices.

AT DANBURY, CONN., To Rent, with power,

an extremely desirable room, 40x100 feet, being a part of the second story of our machine shop. Thirty windows, 3x6 feet, 10 ft. ceiling, heavy double floor, Otis Elevator, Water, Gas, Steam Heaters, Fire Extinguishers, &c.

Suitable for any kind of light manufacturing taking less than 25 horse power. The tracks of the Housatonic R. R. on the one side, and Danbury & Norwalk R. R. on the other, are both within easy speaking distance. Twelve trains leave here daily, reaching New York in 2½ hours; New Haven, 2½ hours; Bridgeport, 1½ hours; Norwalk, 1 hour, &c. *Any part* or the whole of the above will be rented on long or short lease. Terms and other particulars made known on application to

THE HULL & BELDEN CO.,
Mfrs. Machinists' Tools & Drop Forgings,
Danbury, Conn.

Special Notices.

Important to Cash Buyers.

On Tuesday and Wednesday, Oct. 26 and 27, we shall hold, at our Sales Room, No. 15 Murray street, our third and last fall trade sale of

Hardware, Cutlery, Guns, &c.,

of the season. This will comprise our usual well assorted line of goods adapted to the trade—mostly direct from manufacturers and well worthy the attention of close buyers for cash.

BISSELL, WELLES & MILLET,
Auctioneers.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the Dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**
DEEP RIVER, Conn., Sept. 7, 1874.

WANTED TO PURCHASE, 100 tons good Second-Hand T Rails, 18 or 20 lbs. per yard.

Address, giving particulars,
PIPER & THOMPSON,
Lapeer, Mich.

TO LET, A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO.,
101 Duane Street. N. Y.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at ***99 Cannon Street, London, E. C.***

SCALE: First 3 lines, 3/; every additional line, 10d Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Wanted, Second-Hand Bolt Machinery

In good order. Double Headed Bolt Cutter (Chapin preferred), Bolt Header and Bolt Pointer.

Address, with full particulars,
Pottsville Spike, Bolt and Nut Works,
Pottsville, Pa.

Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to

CHESTER STEEL CASTINGS CO.,
Evelina St., Philadelphia, Pa.

To Hardware Merchants.

I have been many years established in business in this city, as a dealer in general Hardware, Tools, Machinery, Miners' Supplies, Agricultural Implements, Pumps, Wagon Makers' Goods, and Manufacturer.

Now, as I find my business increasing, I want to treat with a wholesale house in or near New York, whose principal firm is in England, that will supply me with all the foreign goods I want. Good reference offered. State your terms and address

J. W. BALL,
Carroceria Herreria Inglesa,
Durango City, Republic of Mexico.

Wanted.

A first-class Hardware Salesman, having business acquaintances in New York city and State.

Address **Box 3227, New York.**

25 per cent. extra power

Guaranteed to owners of Steam Engines, or an Equal Saving of Fuel, or a Reduction of Boiler Pressure, by applying

Ransom's Syphon Condenser.

T. SAULT, Consulting Engineer,
General Agent, New Haven, Ct.

Business Opportunities.

New Capital Procured, Partnerships Arranged, and Commercial, Mining and Banking Corporations Organized, by

CLARKE, CHITTY & CLARKE,
Board of Trade Offices, New York.
P. O. BOX, 4071.

Merchant Iron or Nails

Wanted in exchange for 800 tons No. 1 Wrought Scrap Iron.

GILCHRIST & GRIFFITH,
Mount Pleasant, Iowa.

A. PURVES & SON,
Corner South & Penn Streets, Phila.,
Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for all kinds of **Metals and Tools.**

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors,
101 & 103 Duane St., N. Y.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address *CAR WHEEL FOUNDRY,*
P. O. Box 134, Selma, Alabama.

Special Notices.

Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE,

No. 258 Broadway, New York.
A. V. BRIESEN.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,

IRON AND STEEL,
Care of *P. O. Box 813, Bridgeport, Conn.*

DISCOUNT LISTS.

Hinges and Butts. { Stanley Works' 1 st...10 % to 50 % each, 75c. { Union Mfg Co.'s......10 % to 60 % " 75c.

Bolt. File and Hinge and Butt List.—Contains all the lists and discounts that are used..............Price $1 00

Dayton & Lamberson, 97 Chambers St., N. Y.

CLASSIFICATION LISTS OF **American Hardware.**

A book of tables and information of use to every one in the Hardware trade.

PRICE, $4·00 PER COPY.

Send cash for the book, or write for circular giving table of contents. Also Discount Glass Lists, 75c. each. Address, **WM. R. HULL,**
Detroit, Mich.

For Sale, &c.

FOR SALE. Rolling Mill and Bridge Building Machinery, Of NEW ENGLAND IRON COMPANY.

Upright Corliss Engine, 32 in. cylinder, 5 ft. stroke; wheel, 32 tons, 25 ft. diam.
Puddling Train, Merchant Train, 16 in., built by Totten.
Rotary Squeezer, Etc., Etc.
Testing Machine.
Bolt Cutters.
Milling Machines, and all Machinery necessary for Bridge Work. In lots to suit Apply to

WM. E. COFFIN & CO.,
8 Oliver Street, Boston.

Valuable Furnace Site

FOR SALE OR ON ROYALTY,

Possessing ingredients to make Car Wheel Charcoal Pig at $14·75 per ton. Any head of water power, Forest, Iron Ore 70 per cent., Limestone, Clay, Refractory Stone for construction abound together, same property; makes best neutral flange iron.

H. C. WYETH, Baltimore, Md.

For Sale.

A first-class Hardware Business, located in the thriving city of Bloomington, Ills. Above business has been established for over twenty (20) years, and presents to any one desirous of doing an "A No. 1" retail and jobbing trade a most favorable opportunity. Amount of stock about $15,000. Will be sold at a sacrifice. Ample reasons given for selling. For further information, address,

GEO. BRADNER, Bloomington, Ills.

ENGINES FOR SALE.

One 10 horse Engine, $225; two 12 horse Engines at $250 each. All horizontal; in perfect order ready for use, and nearly new. Washington Iron Works make. Address, **C. S. HURD,**
Box 4342, N. Y. City P. O.

FOR SALE.

An ⅜ inch mill train for making Merchant, Band and Hoop Iron. Will be sold cheap.

Apply to **W. W. JONES,**
Near the Lehigh Valley Railroad Depot,
Allentown, Pa.

For Sale, Stove and Tin Business.

Will sell, on good terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 12 men.

Present Stock about $6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their wholesale and retail Hardware Store next door to the above premises. Address

HORSMAN & HORSMAN,
Iron and Hardware Merchants,
St. Thomas, Canada West.

A BLAST FURNACE FOR SALE at Napanoch, Ulster Co., State of New York, on the Delaware and Hudson Canal, with extra facilities, and a capacity of 20 tons per day Anthracite or 15 tons of Charcoal, together with a splendid water-power, goes with the furnace. The furnace is in good order and could be put in blast in a short time. Will be sold very low on accommodating terms. Charcoal can be had for many years.

Address, **H. BANGE,**
94 Gold Street, New York City.

FOR SALE.

At Lowest Manufacturers' Rates.

GUNS & SHEET ZINC,

Best German and Belgian Brands,

By *LOUIS WINDMULLER & ROELKER,*
20 Reade Street, N. Y.

FOR SALE,

at 10c. a copy, Weekly Spanish Review and Prices Current. The undersigned is also a *Translator* from and into the English, Spanish, French and German. *Latest Translations made:* for the governments of Germany and Spain, Pacific Mail S. S. Co, Walter A. Wood; Morris, Wheeler & Co.; Todd & Rafferty; John T. Dunkin; Fisk & Hatch; R. W. Wilde; Wilson Sewing Machine Co.; J. Hess & Co.; H. Marquardt; M. Echeverria & Co., and Chas. E. Little, New York; Hocking Valley Mfg. Co.; W. F. Potts, Son & Co.. Phila.; Atlantic and Pacific Land Co.; B. E. Flemming, Jersey City; Wilder & Co., Savannah, and the Tanite Co.; Stroudsburg ("Emery Grinder"), to whom he refers.

C. KIRCHHOFF,
Metal Reporter of "The Iron Age."
Box 3091, New York P. O.

Trade Report.

Office of The Iron Age
Wednesday Evening, Oct. 20, 1875.

The past week has been without feature of great general interest in financial circles. In general trade there has been some further improvement reported, but it is admitted that the best part of the fall season is over, and that we cannot expect much increase in the demand for manufactured goods from the jobbing and retail trades. The season, while it cannot be said to be a disappointment to a majority of business men, has realized only very moderate expectations.

In the money market call loans have ranged from 2 to 5 per cent., the Stock Exchange rate being 3 per cent. The discount rate on prime business paper is 6 @ 7 per cent. The bank reserves show a further decline resulting from the continued demand for currency from the West and South.

The following is a comparison of the bank averages for the past two weeks:

	Oct. 9.	Oct. 16.	Differences.
Loans	$281,973,600	$284,329,700	Inc. $2,356,100
Specie	6,701,500	6,389,200	Dec. 312,300
Legal tend's	60,356,800	56,495,400	Dec. 3,861,400
Deposits	230,156,100	228,698,800	Dec. 1,457,300
Circulation	17,852,400	17,812,800	Dec. 39,600

Gold has ranged between 116⅝ and 117, and borrowers have been compelled to pay 1-32 @ ⅛ for its use. The following table shows the daily range of the premium.

	Highest.	Lowest.
Thursday	116⅞	116⅝
Friday	117	116⅝
Saturday	117	116⅝
Monday	116⅞	116⅝
Tuesday	116⅞	116⅝
Wednesday	116⅞	116¾

The stock market has been without important feature, with some speculative activity in Lake Shore, Pacific Mail, Western Union, Erie, Missouri Pacific, St. Paul and Northwest. We give below the range of to-day's fluctuations in active shares.

The market for government bonds has been strong here and steady in London. Railway mortgages are also strong and in good demand. We give below the closing quotations of governments.

The following tables show the movements in foreign trade for the week:

IMPORTS.

	1873.	1874.	1875.
Total for week	$4,918,000	$6,602,070	$6,293,220
Prev. reported	323,195,830	316,052,261	266,548,375
Since Jan. 1	$328,113,830	$322,654,331	$262,841,595

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value
Brass goods	18	$2,577
Bronzes	68	13,099
Chains and anchors	40	1,263
Cutlery	102	27,343
Guns	41	8,014
Hardware	10	648
Iron, pig, tons	396	8,795
Iron, other, tons	486	10,236
Iron, ore, tons	798	1,227
Metal goods	123	18,008
Nails	16	1,030
Needles	10	6,231
Old metal		2,763
Per. caps	20	4,053
Saddlery	13	2,211
Steel	1,273	18,200
Silverware	4	291
Tin, boxes	9,360	59,376
Tin, 4514 slabs	462,047	84,156
Wire	12	795
Zinc	60,500	3,993

EXPORTS, EXCLUSIVE OF SPECIE.

	1873.	1874.	1875.
For the week	$7,130,526	$5,552,953	$5,460,384
Prev. reported	230,872,129	230,099,009	196,724,522
Since Jan. 1	$238,002,655	$235,651,962	$202,184,906

EXPORTS OF SPECIE.

Total for the week	$223,808
Previously reported	10,003,488
Total since January 1, 1875	$10,227,296
Same time in 1874	5,161,791
Same time in 1873	10,035,963
Same time in 1872	5,082,651

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	123¾	124
U. S. 6s 1881, reg	121	121¼
U. S. 6s, 1881, cou	122⅞	123
U. S. 5-20 1862, reg	115	116
U. S. 5-20 1862, cou	119	119½
U. S. 5-20 1864, reg	114⅞	115⅛
U. S. 5-20 1864, cou	119	119¼
U. S. 5-20 1865, reg	115⅞	116⅛
U. S. 5-20 1865, cou	119⅜	119⅝
U. S. 5-20 1865, reg. new	118⅞	119⅛
U. S. 5-20 1865, cou	118⅞	119
U. S. 5-20 1867, reg	119⅞	120⅛
U. S. 5-20 1867, cou	120	120⅛
U. S. 5-20 1868, reg	120	121⅛
U. S. 5-20 1868, cou	121	121⅛
U. S. 10-40 reg	115⅞	116
U. S. 10-40 cou	116⅞	117
U. S. 5s, 1881, reg	115⅞	116⅛
U. S. 5s, 1881, cou	117⅛	117⅛

The latest quotations of stocks were as follows:

	Bid.	Asked.
Atlantic & Pacific Preferred	5½	6
American District Telegraph	..	25
Atlantic and Pacific Telegraph	19	20
Chicago & Northwestern	35⅝	36
" " Pref	..	50
Chicago, Rock Island and Pacific	103⅛	103⅜
Chicago, Bur. & Quincy	111	112
Col., Chic. & Ind. Cent	3⅛	3¾
Clev., Col., Cin. & Ind's	49	50
Cleveland and Pittsburgh	90	90¾
Chicago & Alton	94⅞	95⅛
" " Pref	103	104
Consolidated Coal	..	45⅜
Canton	41⅜	42½
Del. Lack. and Western	118⅛	118⅜
Delaware & Hudson Canal	119⅞	120
Adams Express	101	101⅛
American Express	58	58
United States Express	44⅛	45
Wells, Fargo & Co. Express	78	79
Erie	15⅛	15⅜
Harlem	130	130⅝
Hannibal & St. Joseph	17⅞	18⅛
" " Pref	21	22
Illinois Central	92	95
Kansas Pacific	11	11
Lake Shore	56⅝	56⅞
Michigan Central	57⅞	58⅛
Morris and Essex	103	103
Milwaukee & St. Paul	33⅛	33⅝
" " Pref	61⅞	62
Mariposa	6	6½
" Pref	10	11
New York Central	102⅞	103
New Jersey Central	104	104⅛
New Jersey Southern	1¼	1¾
Ohio & Mississippi	16	16⅛
Pacific Mail	39	39⅛
Panama	..	131
Pittsburgh & Fort Wayne	98⅛	98¾
Pacific & Missouri	12⅛	13
Quicksilver	18	19
" Pref	23⅛	24
St. Louis, Kan. City Northern	5	6
" Preferred	27	28
Tol., Wabash & Western	5⅛	5⅝
Union Pacific	69	69⅛
Western Union Telegraph	75⅜	75⅝

GENERAL HARDWARE.

There is a general complaint of a falling off in business within the past few days. But few buyers are in town, and letter orders are not coming in as well as a little while ago. As to changes in price, there have been very few, and in the matter of news this week has been duller than in business.

The Western Hardware Association commenced its annual session at the Grand Hotel, Cincinnati, on Tuesday. In the absence of the President, John Nazro, of Milwaukee, filled the chair. The officers of last year were re-elected. The meeting was held with closed doors, over forty establishments being represented. At a late hour the meeting adjourned until Thursday. To day (Wednesday) the association have been the guests of the Cincinnati trade, who took them in carriages to view the different places of interest. This evening they are to be entertained at a banquet given by the manufacturers. The members express themselves gratified at the result of the meeting, which is stated to be very harmonious.

Russell & Erwin Manufacturing Co. have reduced the price of Jowitt's Files, which they import, from $5 to $4·50 to the pound sterling, in gold.

Iron Wire has been weakening, and we reduce in this issue the prices of some of the most important kinds. Our quotations are as follows:

Bright and Annealed.....Nos. 0 @ 18	dis 45 @ 47½ %
" " ..... " 19 @ 26	dis 50 @ 52½ %
" " ..... " 27 @ 36	dis 55 @ 57½ %
Coppered ..... " 0 @ 18	dis 40 @ 42½ %
Galvanized, Nos. 0 to 9	℔ 8½c @ 9c net
Galvanized, Nos. 10 to 18...market list	dis 10 @ 15 %
Tinned	dis 25 @ 30 %
Cast Steel	dis 15 @ 20 %
Tinned Broom Wire	dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9	℔ 9c @ 9½c
" " Nos. 10 and 11	℔ 10c @ 10½c
" " " 12	℔ 10½c @ 11c
Annealed Fence, Nos. 8 and 9	dis 47½ @ 50 %
" Grape, " 10 to 14	dis 47½ @ 50 %
Fence Staples	℔ 7½c @ 8c

J. Clark Wilson & Co. have a limited stock of a Screw named The Globe, put up in paper boxes of 1 gross each, which they sell at 35 per cent. discount from the regular list. The following are the sizes they have in stock: ⅞ inch, Nos. 7, 9, 10, 11; 1 inch, Nos. 11, 12; 1¼ inch, Nos. 9, 10, 11, 13, 14; 1½ inch, Nos. 11, 13, 14, 15; 1¾ inch, Nos. 13, 14; 2 inch, Nos. 12, 13.

Butts & Berger, on the 1st instant, established themselves as wholesale dealers in job lots of Hardware, Tin Ware and House Furnishing Goods, &c., at No. 95 Chambers street, and the attention of the trade is called to their advertisement on the 24th page.

The Secretary of the Treasury has decided that "wood screws manufactured of the so-called Bessemer steel are subject to a specific duty of 8 and 11 cents per pound, according to length, and do not come within the provision of the tariff providing for the admission of any other screw 'of any other metal than iron,' at 35 per cent. ad valorem.

As will be seen by their advertisement on our 10th page, Van Wart & McCoy have taken the agency for W. Clark's genuine Horse Clippers. This article has had a very large sale in Europe.

E. M. Boynton has obtained a decree in his favor in his suit against Wheeler, Madden & Clemson in the U. S. Circuit Court for the Southern District of New York. The subject in controversy was his letters patent re-issue No. 3566, for Saws containing teeth provided with a cutting edge on each face, the teeth being so made and arranged that the two points of one tooth cut on one side of the kerf, and the points of the next succeeding tooth cut on the other side of the kerf. The decree holds the patent to be good and valid, and orders the usual injunction to issue, with costs.

G. & H. Barnett, Black Diamond File Works, Philadelphia, have just been awarded the Silver Medal and first premium at the Cincinnati Industrial Exposition. This enterprising house is, we believe, the largest engaged in the manufacture of hand-cut Files in this country, employing, as we are informed, over 100 men and boys, and using two large steam hammers, two Bradley cushioned hammers, for forging Files, and a large grinding machine, which they believe to be the best in the world. Beside their trade in this country, they are now selling a considerable quantity of goods in Canada, and, notwithstanding the dull times, they tell us that their trade has doubled within two years. Their agents are: Thomas Taylor, 43 Chambers street, New York; Semple, Birge & Co., St. Louis; Linforth, Kellogg & Co., San Francisco; Stauffer, Macready & Co., New Orleans.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

Wednesday, Oct. 20, 1875.

Scotch Pig.—A fair business has been done under an improved demand, but prices are weaker. The following are the quotations for makers' iron:

Gartsherrie No. 1	71/
Coltness No. 1	76/
Glengarnock No. 1	69/
Eglinton No. 1	64/6

Manufactured Iron is firm, although there is but little demand.

Rails are unchanged.

IRON.

American Pig.—The unsatisfactory condition of the market continues without improvement. Indeed, the feeling seems to grow less hopeful. Iron circles are full of rumors questioning the solvency of many concerns, and this week we have to announce the failure of Moseley, Hodgman & Co., of Boston, and Rogers & Burchfield, of Pittsburgh. A good many other houses are in difficulties, and some of them apparently must go to the wall. The market is continually unsettled by the Iron forced on it by weak producers, by holders who are forced to realize, and by the sale of hypothecated lots. The demand is small and it seems almost impossible to induce buyers to take more than they want for present use. We are not aware of any staple article of which it would be more difficult to sell a large lot for cash without a ruinous sacrifice than American Pig Iron. In his statistical report just published under date of the 1st instant, the Secretary of the American Iron and Steel Association draws the following conclusions:

First. This country produced in 1874 much more iron and steel, from pig iron to the finished product, than any person familiar with the trade has ever imagined. Of pig iron we produced only 178,865 net tons less than in 1873. Of all rolled iron, rails included, we produced only 126,885 net tons less than in 1873, and of rolled iron, excluding rails, we actually produced 33,779 net tons more than in 1873.

Second. The ability of the country to consume iron and steel since the occurrence of the panic is greater than has been generally recognized; otherwise so much of these products could not have been made. True, we carried over from 1874 to 1875 large stocks of pig iron, rails and other rolled iron, but so we have done in former years. Nevertheless, it is unwise to increase these stocks in 1875. The hard times which the iron industry of this country is this year experiencing are intensified by the persistent determination of manufacturers to make pig and bar iron for which there is no market.

We hear of no large transactions this week, and nothing beyond the usual purchases of small lots for consumption. We quote No. 1 Foundry, $25 @ $25·50; No. 2 Foundry, $28; Gray Forge, $20 @ $22. These prices are for prime Lehigh brands, and less favorite brands sell for about a dollar a ton less.

Scotch Pig.—The market continues firm, but with little doing, sales being confined to small lots. We quote: Coltness, $33 @ $33·50; Summerlee, $31·50 @ $32; Eglinton, $30. We note sales of 50 tons Eglinton at $29·50; 50 tons Coltness, $33; 100 tons Summerlee on private terms.

Rails.—We continue our quotation of $45 @ $50 for American, at mill. There is nothing of note to report.

Old Rails.—We quote, nominally, $25 @ $27, but can learn of no sales to verify these prices.

Scrap.—The stock here is not large, and we hear of no considerable transactions. Prices, however, seem firm. We quote, $31 @ $32.

METALS.

Copper.—Sales during the week sum up 600,000 pounds Lake Superior Copper on the spot at 23½c. @ 23⅝c., the market winding up quietly at 23⅛c. @ 23¼c. Nothing has transpired in futures. Baltimore has been selling in a small way at 23c., and we quote the same 22⅞c. @ 23c. Business in the Brass manufacturing regions has thus far this fall proved a sore disappointment, and in view of the limited sales of Brass goods making out there, at highly unsatisfactory rates, some of the manufacturers are said to contemplate reducing the working hours from ten to eight. Situated as they have been and are, since summer, there was no inducement for them to anticipate wants, nor is there as yet a gleam of prospect in the immediate future to change the conservative policy they have been hitherto pursuing. It is questionable, under these circumstances, whether prices can be sustained at this center, at the figures still prevailing, from now forward, unless holders make the sacrifice of one cent, and export some Copper to Europe. As matters stand at present, there is a gradual accumulation of stock beyond our domestic requirements, for which an outlet should be found through export. The principal holders have till now been averse to adopting such a policy of a partial export, chiefly because the smaller mines would reap the benefit from subsequently enhanced rates without sharing in the sacrifice of a low sale for export. Finally, however, they may waive this objection and embrace a bold, practical plan, such as the one alluded to. Toward the commencement of December, it is true, navigation on Lake Superior will close, but rail from Detroit always keeps Copper within reach, and higher prices then may more than counterbalance a dearer conveyance. Within the next four weeks these matters will be brought to a test, unless activity in the Brass regions suddenly revives, of which no indications are as yet perceptible. There are no late telegrams from London. Manufactures of Copper are quiet at the following quotations: New Sheathing, 30c.; Bolts and Braziers, 31c.; and Nails, 38c. @ 39c.; Bronze and Yellow Metal Sheathing, 21c.; Yellow Metal Bolts, 28c., and ditto Nails, 21c., net cash.

Tin.—The market here has relapsed into a state of decided dullness, nothing beyond a moderate jobbing trade being transacted. We consequently cannot quote the various kinds any higher than the following: Straits, 19¾c, gold; English Refined, 19¾c.; do. Common, 19¼c.; and Banca, 24¼c., all gold, large lots. Europe is keeping up well at the recent improvement, London telegraphing £86 for Straits, while Singapore remains at $23·50 per picul. The accounts from Cornwall of a considerably reduced output since July, and purchases to the extent of some 4000 tons Foreign by some of the leading smelters there and in London since then, are certainly elements not to be overlooked, the decrease in Domestic production in England being estimated at something like 300 tons ore per month since summer. It should, however, be remarked that the most powerful one of the purchasers we have alluded to may at any time change his policy, and throw large lots of Foreign on the London market all of a sudden, as he has been wont to do in times past, if it suits his interests. The so-called deliveries to consumption are not always *bona fide* deliveries, and certainly enough money has been lost on Tin during the past two years to recommend caution. Thus the visible supply in Europe, notwithstanding the large purchases during the three months, was, on the 1st inst, still 11,956 tons, against 12,691 July 1. It was 9979 tons Oct. 1, 1874; 8906 Oct. 1, 1873; and 6077 Oct. 1, 1872. From a statistical point of view there is consequently little to support the article; its only hope remains the continuation of extensive *bona fide* deliveries to consumption. The 300 tons per month decrease in Cornwall will not do it. *Tin Plates.*—This article, on the other hand, is much better situated than it is generally given credit for. The increase in the value of Hematite Pig Iron in England, as well as of Block Tin, taken together cause Tin Plates to cost 1/ per box more to produce than their actual market value over there. But this is not enough. At the present cost in England the cost of importation here is about 50c., gold, per box above the actual selling price which we quote. And while this is the case the demand from dealers' hands is larger in bulk than what it was a year ago; their sales at 15 per cent. less price indeed foot up larger in the aggregate value than a year ago. The stock has, meanwhile, all passed into dealers' hands, who might as well insist on $8, gold, per box for Charcoal Bright, ordinary brands, as sell below the cost of importation at $7·37½ @ $7·50, gold. Under these circumstances it seems to us that consumers can hardly make a mistake if they anticipate wants to the extent of their convenience or their means; the article seems exceedingly safe as it is. We quote on a very quiet market, gold, per box, ordinary brands, in large lines, Charcoal Bright, $7·37½ @ $7·50; do. Ternes, $7 @ $7·25; Coke Tin, $6·37½ @ $6·62½; and do. Ternes, $6·25.

Lead.—The "Richmond" brand Lead we spoke of in our last went into store for want of a buyer; on the other hand, 150 tons "Selby" sold at 5·60c., gold, on the dock. Some other sales were made, together 100 tons, in lots at 5·60c. @ 5·62½c., gold, all Common Domestic. Lead at the West, especially in fine grades, meets with a ready demand and remains scarce out there, and to lay the same down here at the enhanced freights would cost 7¾c. @ 7⅞c., currency, the latter for select, the last sale having been made at 7⅞c. currency, for select. In these descriptions between 1000 and 1200 tons have sold on this coast during the week at or about 7⅞c., currency. In Foreign nothing transpires; we nominally quote common 7⅛c. @ 7¼c., gold. The European markets remain firm. The manufactures of Lead are unaltered at 8⅜c. for Bar and Pipe, and 9½c. for Sheet, less 10 per cent.

Spelter and Zinc.—What we have said under the head of Copper respecting the inactivity in Brass goods, has its immediate application to Spelter, also, which remains sluggish at 7¼c., currency, less 1 per cent. for Domestic, and 7·15c. @ 7·37½c., gold, for Foreign; in the latter nothing transpiring either on the spot or afloat. The increasing demand in Europe can be filled with difficulty only. *Sheet Zinc* steady at 9c. @ 9½c., gold.

Antimony.—London remains unaltered at the combination figure of £59. We are moderately active here at 13¾c. @ 14c., gold. Stock light.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending Oct. 19, 1875:

Hardware.

Alexander E. L.
Wire, cks., 12
Boker Hermann & Co.
Arms, cs., 13
Mdse. pkgs., 4
Packages, 8
Blaine & Co.
Wire rope, coils, 2
Friedmann & Lauterjung.
Mdse. pkgs., 3
Folsom H. & D.
Arms, cs., 7
Mdse. cs., 15
Mdse. pkgs., 4
Frasse P. A. & Co.
Mdse. pkgs., 10
Field A. & Co.
Mdse. pkgs., 17
Casks, 3
Chains, cks., 3
Grimaldi, Brown & Co.
Anvils, 2
Lennox E. S. & Co.
Iron wire, lots, 468
Laughland & Co
Netting, cs., 1
Wire, bbls., 1
Wire, cs., 2
Merchants' Dispatch Co.
Arms, cs., 26
Noyes, White & Co.
Gun caps, cs., 4
Prosser Thos. & Sons,
Iron ware, pkgs., 30
Remington E. & Sons,
Gun barrels, cs., 10
Schoverling & Daly,
Arms, cs., 2
Gun caps, cs., 4
Cartridge cases, cs., 16
Sanders W.
Guns, cs., 3
Cutlery, cs., 1
Packages, 3
Van Neet A. R. & Co.
Mdse. pkgs., 2
Van Wart & McCoy,
Mdse. pkgs., 19
Western Union Telegr'ph Co.
Galv. wire lots, 200
Windmuller L. & Roelker
Arms, cs., 8
Wiebusch & Hilger Mfg. Co.
Mdse. pkgs., 15
Order.
Casks, 7
Files, cks., 2

Iron.

Alexander E. L.
Rods, lots, 40
Cooper Heper,
Cast, cks., 2
Henery & Parker.
Pig, tons, 75
Lang W. Bailey & Co.
Tire blanks, 37
Laughland & Co.
Hay bands, bdls., 475
McColl Duncan,
Scrap, cks., 1
Scrap, lots, 1
Marvel Wm. D.
Ore, tons, 198
Mitander Nils,
Bars, 2616
Naylor & Co.
Bars, 1927
Tyng & Co.
Mdse. pkgs., 8
Order.
Sheet, pkgs., 50
Pig, tons, 150
Bundles, 73

Steel.

Brown Wm.
Cases, 30
Bundles, 148
Frith Edward,
Bundles, 5
Cases, 3
Garvin & Son,
Bundles, 74
Hogan John.
Cases, 30
Casks, 3
Woodford W. O.
Cases, 63
Bundles, 219
Order.
Scrap, lots, 1
Cases, 5
Barrels, 5
Bundles, 359
Bars, 1

Metals.

Bruce & Cook,
Tin plates, bxs., 1000
Kidder, Peabody & Co.
Zinc, cs., 4
Lamarche H.
Zinc, cks., 130
Marquardt H.
Lead, bags, 1
McColl Duncan,
Scrap, cks., 2
Noel, Saurel & Marniffee,
Tin, cs., 3
Phelps, Dodge & Co.
Tin plates, bxs., 3795
Shepard Sidney & Co.
Tin plates, bxs., 163
Windmuller L. & Roelker
Zinc, cks., 50
Order.
Zinc, cks., 130
Tin plates, pkgs, 3488
Tin, slabs, 190
Tin, ingots, 600

COAL.

We note some improvement in the market for Anthracite Coal. The demand for the smaller sizes is active, and prices are well maintained; for the larger sizes there is not much improvement. There seems to be a little unpleasantness arising in the combination of the six great Coal companies. At the meeting of the corporations, embracing the Reading Railroad Company, the Lehigh Valley Railroad Company, the Central Railroad of New Jersey Company, the Lehigh and Wilkesbarre Coal Company, the Delaware and Hudson Canal Company, and the Delaware, Lackawanna and Western Railroad Company, held on the 20th of September, it was agreed that the two last-named companies, who had been working during the long strike in other localities which commenced last January, should suspend operations for two weeks in October, in order to allow the other members of the combination to catch up the quota appropriated to them for the present season. It is alleged that the Delaware, Lackawanna and Western Railroad Company have ignored their portion of the contract by shipping coal to competitive points, to the extent of about 20,000 tons last week, and within 10,000 tons of the quantity forwarded to tide water up to the same time last year. How serious the falling out may prove to be cannot be definitely determined until the meeting of the combination, which takes place to-day (Wednesday). Prices of Coal for the ensuing month will also be adjusted at the meeting.

The quantity of Coal sent from the Schuylkill region during the past week was, by rail, 122,658 tons; by canal, 32,486 tons; total, 155,144 tons, against 143,659 tons for the corresponding week of last year. Increase, 11,485 tons. The total shipments so far this year were 3,299,413 tons, against 3,618,780 tons for same period last year; decrease, 319,367 tons.

The quantity sent from all the regions for the week was: Anthracite, 586,663 tons; Bituminous, 90,826 tons; total, 677,489 tons, against 522,113 tons Anthracite, and 78,586 tons Bituminous for the corresponding period of last year. Increase of Anthracite, 64,550 tons; increase of Bituminous, 2240 tons. Total increase, 66,790 tons.

The quantity sent from all the regions so far this year was 15,204,415 tons Anthracite, and 3,023,892 tons Bituminous. Total, 18,228,307 tons, against 15,499,728 tons Anthracite, and 2,833,789 tons Bituminous for the same period of last year. Decrease of Anthracite, 295,313 tons; increase of Bituminous, 190,103 tons.

We quote as follows: Anthracite, $4·95 @ $6·10; Cumberland, $6·25 @ $6·75; West Virginia, $6·75 @ $8; James River Steam, $6·25; James River Carbonite, $9 @ $9·50; Kanawha House, $11·50; American Gas, $6·75 @ $7·25; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $6·75; Murphy Run, $6·50; Newburgh Orrel, $6·50; Sterling Ohio, $10; Ince Hall, $17 @ $18; Liverpool House Cannel, $17; Liverpool Gas, $12; Newcastle Gas, $7; Scotch, $7·50 @ $8.

OLD METALS, PAPER STOCK, &c.

Old Metals are as dull as we have noted heretofore. Consumers are diffident about purchasing, and only present wants are considered. The market for Old Rags and Paper Stock is improving slowly, and some grades of Rags are in good demand, especially Woolens and White Linen. No. 2 Grass Rope is moving freely at firmer prices. Other articles present no material change. We quote the following as the current purchasing rates:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4½c.; Zinc, 4¼c. @ 4½c.; Pewter, No. 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1c.; Sheet do., ½c.; Cast, do., ½c.; Machinery, do., ⅝c.

Rags, &c.—Canvas, Linen, 4¾c. @ 5¼c.; do. Cotton, No 1, 5¾c. @ 6¼c.; No. 2, 2¼c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1¼c.; Jute Butts, 1⅝c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1¼c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4⅛ @ 5c.; do. No. 2, 3c.; Tarred Shaking, c. @ 1¼c.; Grass Rope, 3c.

PHILADELPHIA.

Philadelphia, Oct. 19, 1875.

The market continues quiet, with no material change in price to note, but a small volume of business. There is as yet no improvement in prices usual before the close of navigation, nor is such generally expected now. A general belief, however, obtains that the improvement in business West must soon be reflected on the trade East, and that before spring the Iron business will have resumed its wonted activity. Several of the mills have lately resumed work which have been idle for some time. Among these are the Palo Alto mills, Pottsville, and the mill of Stephen Robbins & Son, in this city, the latter of which had been idle for over a year on account of difficulty with puddlers, who, having experienced one hard winter, are quite willing now to accept fair wages rather than undergo another. The puddlers are still out, however, at several of the city mills and at Catasauqua, with no prospect of a settlement. The telegraph announces the suspension of Rogers & Burchfield, of McKeesport, Pa., manufacturers of Russian sheet iron. It was generally supposed that this mill had a great advantage over others through the use of natural gas fuel, in economizing coal and improving product. Particulars of the failure not to hand as yet. The principal business doing is in Rails, which some buyers are now inclined to think may be cheaper than they can ever be again, which is probably true. Prices are nominally the same, although very much cut all around, in sales. We quote:

Pig Iron.—No. 1 Foundry, $25; No. 2, $22; Gray Forge, $21 to $22.

Bars.—2·6c. to 2·7c. per lb.

Rails.—$45 to $50, at works, as to make and section.

Old Rails.—$26 to $26·50.

Scrap.—$31 for No. 1 Wrought.

The sales, which have been light, include some 3500 tons Pig Iron, about equally divided between the different grades, but in some cases at figures below quotations, and generally kept private; 1000 tons Rails (56s) to a near-by road at $47, and 2500 tons more at quotations. We hear of no sales of Old Rails, but some of small lots of Wrought Scrap, which is relatively scarce at current prices.

PITTSBURGH.

Pittsburgh, Oct. 19, 1875.

Pig Iron.—Trade, instead of improving, as it was expected it would and usually does at this season of the year, appears to be growing worse and worse; there is considerably less doing now than during mid-summer, and while it is hoped there will soon be a change for the better, the indications at present are by no means encouraging. There is scarcely any inquiry, and what little there is is for small lots for mixture, as the mills, without an exception, are not buying a ton more than they can possibly help; they (the mills) have but few orders, and, as there is every prospect of a lock-out between now and the close of the year, there is no inducement to stock up. Prices, however, remain about as last quoted. Occasional sales

are reported below current quotations, but, as a rule, holders of standard forge irons are refusing to make concessions, and, furthermore, it is doubtful whether buyers would take hold, even if they could buy at 50 cents to $1·00 under asking rates. Choice brands of gray forge are still held at $24, 4 months, and the supply in this market is down lower than it has been for many years. No. 1 foundry is quoted at $26 to $27, 4 months, and No. 2 at $24 to $25, with most of the sales at the inside figures.

MANUFACTURED IRON.—The general position of the market remains much the same as noted in our last report. Trade continues very dull and unsatisfactory, and there is not much prospect of an improvement until after the close of the year, if then. Orders are coming in sparingly, and mostly small, and at current rates there is little or no margin for profit to the maker. There is a very fair trade in Sheet Iron, but all other kinds are dull. The demand for Hoop Iron has slacked off considerably within the past week or two, and the season for Cotton Ties is over. Merchant Bars are still quoted at from 2·30c. to 2·40c., 60 days, but sales, it is said, are being made below quotations, notwithstanding they barely cover actual cost.

NAILS.—The Nail trade continues dull and unsatisfactory. Orders have slacked off very materially of late, and there has been no improvement in prices. Some of our factories are not running much over half time, very few, if any, working up to their full capacity, as manufacturers generally appear determined not to stock up in the present condition of affairs. Quotations may be freely given at $2·90, 60 days, with 2 per cent. off for cash.

STEEL.—The steel mills are all reported in operation, although but few of them are working up to their full capacity. However, while our manufacturers are not to say crowded with orders, they are doing a very fair business, and the great source of complaint is in regard to prices, which have been cut to such extent, that for the ordinary grades the margin is very small.

SCRAP IRON.—There is next to nothing doing; dealers report business more depressed than it has been at any time since the panic. Prices entirely nominal; there is not enough doing to establish rates.

ANOTHER SUSPENSION.—Messrs. Rogers & Burchfield, who have two mills, one at Leechburgh and the other at Apollo, Armstrong county, Pa., but whose place of business is in this city, suspended on Saturday. It is said that they will make a very fair showing; that their liabilities do not much exceed $200,000, and if so they will probably get an extension.

MILLS IDLE AND IN OPERATION.—The following Pittsburgh mills are running: Double turn—Jones & Laughlins, Byers & McCullough (lower mills), Sligo, Clinton, Painter's, Mullen & Maloney, Pittsburgh Forge and Iron Company, Lewis, Oliver & Phillips (lower mill), Girty's Run, Clark's, Kloman's, Shoenberger's (old mill), Moorehead's. Single turn—Chess, Smythe & Co., Byers, McCullough & Co. (upper mill), Lewis, Oliver & Phillips (upper mill), Dilworth, Porter & Co., Lindsay & McCutcheon (new mill), Wilson, Walker & Co., Spang, Chalfant & Co., Lloyd, Son & Co., Everson, Macrum & Co.

The following mills are idle: Frankstown, Keystone, Brown's (bar mill running), Resse, Graff & Woods (temporarily for repairs), Wharton's. The steel works in the city and vicinity are all running.

THE EXPOSITION.—Although late in opening up is well attended, and the display is even better than the most sanguine had expected. The display of machinery is large and attractive, and is one of the main features of the exposition.

The Pittsburgh *Commercial* of Oct. 16th says: Complete stagnation is the only term that will correctly describe the condition of the pig metal market this week, and it is impossible for us to say how long it is to remain in that condition. The meager sales reported below confirm the gloomy description written above. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

70 tons close gray forge	$23·00—4 mos
30 tons gray forge No. 1	24·00—4 mos
20 tons No. 1 foundry	27·50—4 mos
20 tons No. 1 foundry	27·00—4 mos
20 tons foundry	25·00—cash.
10 tons No. 2 foundry	24·00—cash.

CHARCOAL.

120 tons No. 1 foundry h. r.	$28·00 @ 31·00—4 mos.
110 tons No. 1 and 2 h. r.	private terms.
10 tons cold blast	private terms.
20 tons Eastern	$34·00—4 mos.

CONNELLSVILLE COKE.

20 tons No. 2 foundry	$24·00—cash.
10 tons No. 1 foundry	25·00—4 mos.

BLOOMS.

30 tons charcoal	$68·00—4 mos.
20 tons charcoal	$65·00—cash.
15 tons charcoal	$68·00—4 mos.
10 tons charcoal	65·00—4 mos.

CLEVELAND.

Messrs. C. E. BINGHAM & CO., 25 West Main street, under date of Oct. 18, quote the Iron market as follows, 4 mos. time:

FOUNDRY IRON.

No. 1 Lake Superior Charcoal	$31·00—4 m.
No. 2 " "	30·00—4 m.
No. 1 Anthracite	28·00—4 m.
No. 2 "	26·00—4 m.
No. 1 Bituminous	27·50—4 m.
No. 2 "	26·00—4 m.
No. 1, Cherry Valley Am. Scotch	31·00—4 m.
B—1 " "	28·50—4 m.
No. 2 " "	27·50—4 m.
No. 1 Massillon	30·50—4 m.
B—1 "	29·00—4 m.
No. 2 "	25·50—4 m.

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	$30·00—4 m.
No. 4 "	32·00—4 m.
Nos. 5 & 6 "	32·50—4 m.

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	$30·50—4 m.

FORGE IRON.

No. 1 Gray	$24·50—4 m.
White and Mottled	22·50—4 m.

LOUISVILLE.

Messrs. GEO. H. HULL & CO., under date of Oct. 18, writes us as follows: The mills and foundries, as a general thing, are full of work. There is more demand for Iron, but prices show no improvement. The usual time, four months, is allowed on the quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$25·00 @ 26·00
" 2 " " "	24·00 @ 25·00
" 1 Mill, " " "	22·00 @ 23·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	23·00 @ 24·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	21·00 @ 22·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	22·00 @ 23·00

HOT BLAST STONE COAL AND COKE.

No. 1 F'dry, from Hanging Rock Ores	$23·00 @ 24·00
" 2 " " "	22·00 @ 23·00
" 1 Mill, " " "	21·00 @ 22·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	23·00 @ 24·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	22·00 @ 23·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	21·00 @ 22·00
" 1 F'dry, from Missouri Ores	24·00 @ 25·00
" 2 " "	24·00 @ 25·00
" 1 Mill, "	26·00 @ 27·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	35·00 @ 40·00
" " Tennessee Ores	28·00 @ 30·00
" " Alabama and Georgia Ores	28·00 @ 30·00
Car Wheel from Kentucky Ores	28·00 @ 40·00

CINCINNATI.

Messrs. L. R. HULL & CO., under date of Oct. 18, write us as follows: PIG IRON.—Without doubt the passing State election, by dividing attention, has influenced trade during the past week, but a fair demand has prevailed with prospects of an improvement. Prices range very low, and the market generally is not in a satisfactory condition. Consumers adhere more closely than ever to a strictly hand-to-mouth policy, purchasing as close in price as possible.

HOT BLAST CHARCOAL.

Hanging Rock No. 1..₩ ton.	$25·50 @ 26·00—4 mos.
" " No. 2	23·50 @ 24·00—4 mos.
" " Forge	21·00 @ 22·00—4 mos.
Southern Brands No. 1	23·00 @ 24·00—4 mos.
" " Forge	21·00 @ —4 mos.
Virginia No. 1	24·50 @ 25·00—4 mos.
" No. 2	22·50 @ 23·00—4 mos.
" Forge	21·00 @ 22·00—4 mos.

HOT BLAST STONE COAL AND COKE.

Hanging Rock No. 1..₩ ton.	$23·00 @ 24·00—4 mos.
" " Forge	21·00 @ —4 mos.
Red Short No. 1	27·00 @ —4 mos.
" " Forge	24·00 @ —4 mos.
Am. Scotch, No. 1	24·00 @ 25·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel ₩ ton.	$40·00 @ 50·00—4 mos.
Missouri " "	35·00 @ 40·00—4 mos.
Southern Br'ds " "	30·00 @ 40·00—4 mos.
Machinery and Forge	30·00 @ 35·00—4 mos.
Blooms	70·00 @ 90·00—4 mos.

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of Oct. 14, report the Iron market as follows: Our market shows no special change; the demand is good for cheap Irons. Our quotations are fully up to the market, and we learn of many sales much less, but for special lots only.

Mo. Stone Coal, No. 1 F'dry.	$27·00 @ 28·00—4 mos.
" " No. 2 F'dry	25·50 @ 26·00—4 mos.
" " No. 1 Mill	25·00 @ 26·00—4 mos.
" Charcoal, No. 1 F'dry	27·00 @ 28·00—4 mos.
" " No. 2 F'dry	25·00 @ 26·00—4 mos.
" " No. 1 Mill	25·00 @ 26·00—4 mos.
Tenn. Charcoal No. 1 F'dry	26·00 @ 27·00—4 mos.
" " No. 2 F'dry	25·00 @ 26·00—4 mos.
" " No. 1 Mill	24·00 @ 25·00—4 mos.
Georgia Coke No. 1 Mill	25·00 @ —4 mos.
" " No. 2 Mill	24·00 @ —4 mos.
H. R. Charcoal No. 1 F'dry	27·00 @ 29·00—4 mos.
H. R. " No. 2 F'dry	25·00 @ 27·00—4 mos.
H. R. " No. 1 Mill	25·00 @ 26·00—4 mos.
Massillon, A No. 1 Iron	35·00 @ 36·00—4 mos.
" B, No. 1 Iron	33·00 @ 33·00—4 mos.
" No. 2 Iron	30·00 @ 31·00—4 mos.
Cold Blast Car Wheel, Mo.	32·00 @ 33·00—4 mos.
" " " Tenn.	32·00 @ 35·00—4 mos.
" " " Ala.	32·00 @ 35·00—4 mos.
" " " Hanging Rock	50·00 @ 53·00—4 mos.
No. 1 Wrought Scrap	1c. per lb.
Heavy Cast "	9·10c. "
Light Cast "	5·10c. "

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of Oct. 19: Trade continues quiet and depressed, with unremunerative figures ruling on all important transactions, and we quote the market dull with unaltered list:

AMERICAN REFINED BAR IRON.

1 to 6 wide by 3/8 to 1 thick..; 1 to 4 1/2 wide by 1 1/2 to 2 thick	2·6·10 to 2·7·10c. ₩ lb.
Round and square, ordinary sizes, from 3/8 to 2 inclusive	2·6·10 to 2·7·10c.
Hoop Iron, 1 1/2 wide and upward	4 1/2 to 4 3/4c.
Band Iron, from 1 1/2 to 4 in. wide	3 1/4 to 3 3/4c.
Horse Shoe Iron 3/8 to 1 wide by 1/4 to 5/8 thick	4 to 4 1/4c.
Norway Nail Rods	7 to 7 1/2c.
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15 1/2 to 16c.
Machinery Steel	11 to 11 1/2c.
Cast Spring Steel	10 to 10 1/2c.
Homogeneous Steel Plate	16 1/2c.
Perkins' Horse Shoes, per keg of 100 lbs.	$5·12 1/2
" Mule Shoes " "	6·12 1/2

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per lb.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per lb.

R. R. Spikes....3 1/4 by 9-16 at 3c to 3 1/4c. per lb.

Messrs. R. C. HOFFMAN & CO., Iron and commission merchants, Nos. 23 and 25 South Frederick street, report the Pig Iron market as follows, under date of Oct. 18: We have no change to note in the Iron market for the last week. Prices continue dull and depressed. We quote:

Baltimore Charcoal	$32·00 @ 35·00
Virginia "	30·00 @ 34·00
Anthracite No. 1	23·00 @ 26·00
" No. 2	23·00 @ 24·00
" No. 3	22·00 @ 23·00
White and Mottled	19·00 @ 20·00

BOSTON.

OCT. 16.—*Pig* is moving in trifling lots rather more generously than for two weeks, but the prices seem to hang close to our inside quotations, and in cash instances 50c. to $1 under on No. 1. Two leading sellers have ceased to name quotations, and, although not out of the market, are not quotably upon the market, but are understood to be looking to a business which shall appreciate good brands No. 1 at $28 to $29 on board car. The failure of a leading firm, however, has not as yet precipitated any stock on the market. We quote nominally No. 1, $28 to $30; No. 2, $24 to $26; and Gray Forge, $21 to $24. New York prices announced here are $25 to $28 for No. 1; $23 to $26 for No. 2; $20 to $24 for Gray Forge. *Bar* has had a fair jobbing business, with prices on warranted Iron steady at $57·50. In fact, the market shows a little better tone this week, one or two large buyers being willing to sell for less than $58, cash. Common Iron is nominally dead. The little business doing goes in one brand, and runs from $51 to $53, the best known and more popular securing the higher price. *Steel* has had a quiet week, tool makers and sleigh smiths being the only business. Prices are firm on foreign and American. We quote: American Tool, 14c. to 15c.; American Machinery, 9c. to 9 1/2c.; Bessemer Tires, 7c. to 7 1/2c.; Sweet's Excelsior Tire, 8 1/2c. to 12c.; English Tool, 16c. to 18c., gold. *Copper* has been stiffened up by the hydraulics of the Calumet Hecla party, notwithstanding the manufacturers' meeting in Boston on Wednesday, they agreeing to stand out of the market, and to buy in old metals the major portion of their supplies. The sheathing metal men and brass founders will shut down almost wholly during the next six weeks, and altogether the use of ingot will go on in the most economical way. The issue has resolved itself into a question of the strength of copper speculators and the consumers. There is nothing offering for futures, spots quoting at 23 1/4 firm. For manufacturers we quote: New Sheathing, 30c.; Bolts and Braziers, 31c.; Yellow Metal Bolts, 30c. to 29c. *Lead* is a little firmer at the decline last noticed, and the market is a trifle better. We quote Pig 5 3/4c. for Domestic, and 6 3/4c. to 6 1/2c. for Foreign; Sheet and Pipe Lead, 9c., currency; Tin Lined Pipe, 16 1/2c.; Bar Lead, 9c., less usual trade or 10 per cent. discount. *Antimony* is firm, with very little business, quoting from 13 1/4c. to 13 1/2c. as to lots bought. *Spelter* is strong and dull at $7·55, 30 days, and $7·40, prompt cash, all currency. Silesian is having a trivial business at $7·30. *Tin* is steadier and a trifle buoyant, without as yet any further advance being established. We quote: Straits, 20c.; Banca, 24c.; Refined English, 19 1/2c. to 20c., gold. Plates are active; we quote Charcoal I. C., $7·25 to $7·75; Coke, $6·50 to $6·75; and Terne at $6·15 to $6·50, gold.—*Com. Bulletin.*

FOREIGN.

FRANCE.

(*Moniteur des Interets Materiels*).

PARIS, Oct. 3, 1875.—*Metals.*—The amelioration in the European metal markets, which has developed during the past few months, has made some further slight progress during the week. The period which preceded this gradual revival has been such a protracted one of stagnation and discouragement, both stocks and prices have been greatly relieved, and with moderate stocks on hand, are imbued with a new spirit, and enter upon the promising era which seems to approach with great confidence. The month just brought to a close has shown great firmness, and figures compare favorably with those at its commencement as regards Tin, Lead and Spelter. An exceptionally active winter campaign now seems to be in prospect, and unless something unforeseen occurs, there is every likelihood of a still further improvement in the immediate future. The only disquieting feature perceptible is the condition of the money market, and although not precisely alarming, there are some anomalies which recommend extreme caution. We allude more specially to the high discount rate ruling in Prussia, which cannot fail to disturb the remaining financial centers, inasmuch as specie will be attracted by a high interest, and the drain on the banks of London and of France will be immediate. The transformation of the monetary system of Germany is probably the main cause of the disturbance, and as this was unavoidable, it is perhaps as good that it should have occurred during the incipient stages of improvement in the metal markets. It will now, at least, serve us as a warning that we should not overlook the money market, and that great circumspection will be imperative. *Copper.*—There has been a steady demand for Chili Bars in the various markets, our own included, chiefly, we suspect, for the covering of outstanding contracts made by operators for a decline. At the same time rather lighter charters seem to be anticipated now on the West Coast, and this belief has assisted in lending strength to the metal, Bars in particular. The demand for manufactured has been less brisk, spreading a quieting tone at both Paris and Havre toward the close. We quote Chili Bars, deliverable at Havre, 217·50 francs; Common ditto, 212·50; Ingots, 222·50; English Tough Cake, none on hand; pure Cororoco Ore, 215; Lake Superior, at Havre, 235. Marseilles is steady at 215 for small ingots. *Tin* has been, on the whole, quite firm, but, during the latter part of the week, a good many chance speculators, not properly belonging to the metal trade, thought fit to unload and realize profits under stimulus of the good ruling of the Dutch sale, causing some fluctuation and a passing weakness. Opinion is still in favor of an ulterior advance, based on the, as yet, comparative cheapness of the metal, and the generally fair aspect of business matters in the trade. We have remained quite firm here, and quote Banca, at Havre or Paris, 237·50; Straits, 222·50; and English, at Havre or Rouen, 222·50. At Havre, Banca commands 225 to 230, and at Marseilles Straits and Billiton are 225. In *Lead* nothing of special interest has occurred; uniform firmness at the North, and a slight wavering at Marseilles are the leading characteristics. We quote French and Spanish here, 59 francs; Spanish, at Havre, 56; and, at Marseilles, 54·50. Stocks of *Spelter* have been so much reduced at the centers of distribution that the producers in the Silesian mountains have it now pretty much all their own way, and the tendency, if anything, still remains upward, especially also in Sheet Zinc. We quote raw Spelter here and at Havre, 65 to 65·50 francs. Havre is steady at 64·50 to 65. *Iron.*—Prospects for the ensuing campaign are still rather vague, and accounts from the Iron districts of France are no better than they were a week ago. Prices are unaltered, but the outlook is the reverse of cheerful, although several new railways, telegraph lines and tramways are projected. *Coal* prices are well upheld here, and freights are slightly looking up, all the river craft being engaged for the conveyance of Coal.

BELGIUM.

(*Revue Universelle*).

BRUSSELS, October 3, 1875.—*Iron.*—Although the demand for Iron of every description continues active, prices are far from remunerative. The general Iron situation has undergone little change during the week. At Luxembourg Pig Iron is rather firmer. Our government since the late tenders has availed itself of the option of taking 20,000 tons Steel Rails additional at 22·50 francs. In a recent publication Mr. Von Frey, director general of the agricultural department in Austria, has given some interesting particulars of certain experiments made at Prevali in direct manufacture of Iron and puddled Steel by means of the Siemens process. *Coal.*—There has been an uninterrupted improvement in the Belgian Coal markets. The approach of winter has imparted a fresh impulse to the ordering of Coal for household purposes, and everything leads to the expectation of a serious revival. Inquiries, with some anxiety manifested on the part of purchasers of making more extensive contracts, begin to pour in, manufacturers at length arriving at the conviction that it is in their interest not to tarry any longer. Stocks are nearly everywhere exhausted, and Coal is moving in every direction with the greatest steadiness. *Coke* forms an exception, not being wanted at present. The Liege district is specially singled out for orders of moment, and Coal companies are taking energetic steps in order to satisfy the most urgent requirements.

GERMANY.

(*Borsenhalle*).

HAMBURG, Oct. 2, 1875.—*Metals.*—Business has quieted down somewhat in consequence of the high discount ruling in the interior, much to the inconvenience of legitimate trade. This state of affairs in financial matters seems to be transient merely, inasmuch as it is the more immediate result of the great monetary changes which the country has recently been subjected to; hence no deeper importance should be attached to it. Trade in general now rests on a pretty sure foundation, and in metals in particular, which, on the whole, enjoy a good consumptive demand, while prices, higher as they are, have not been bolstered up by speculation, but by the ordinary commercial influences of demand and supply. Stocks are light, and consumption proceeds on a satisfactory footing. *Copper* has been quiet but steady at the various distributive centers of the country, and the following are the quotations: At Berlin, English and Australian, 90 to 93·50; Mansfield Refined, 94 marks; here Drontheim, 94; Demidoff, 105; Lake Superior, 100; Quincy, 98; Minnesota, 101; Chili Refined, 89; at Stettin, Swedish, English and Chili, 95 to 100. *Tin* has remained strong, as follows: Here, Banca, 96; English, 95·50 to 96; at Berlin, Banca, 95·50 to 96; and English, 92·50 to 93; Banca, at Stettin, 98 marks. *Lead.*—Scarcity and increased firmness are the rule. The following are the quotations: At Berlin, Tarnowitz, Hartz and Saxonian, 23·50 to 24 marks; here, English, 25·80; German, 24·75 to 24·50; Spanish, 26·10. At Stettin, Spanish, 27; Tarnowitz, 23 to 25; German, 23 to 25. At St. Petersburg the quotation is 29 1/4 to 29 1/2 roubles the 164 kilos. *Spelter* remains as firm as ever, and may be quoted as follows: At Berlin, 24·75 to 25·50 for good Silesian; at Breslau, common, 23·75; W. H., 24·50, and Godulla, 24; at Stettin, 25 to 26; here, Silesian, 25·20, spot, and 25·10 to arrive; Zinc White, 33 to 37 marks. All the foregoing quotations are understood to be the 50 kilos.

HOLLAND.

(*Koch & Vaerboom*).

ROTTERDAM, Sept. 28, 1875.—*Tin.*—The market is in a very firm attitude. Banca has been paid 53 guilders, deliverable from the September sale, and slightly more for the November sale has been done at 53 1/4, and Billiton at 50 to 53 3/4. Present stock on warrants 103,250 slabs Banca, against 3155 in 1874; September deliveries 4800 slabs Banca, against 4976 last year; total deliveries since January 1: 98,904 slabs Banca, and 3153 Billiton, against 99,530 and 2967 in 1874. There are afloat by sailing vessels 9950 piculs Banca, against 2200 last year. The stock of Billiton in private importers' hands to-day is 29,188 slabs. *Copper* is steady at 50 to 52 guilders for Drontheim. *Lead* shows no change, the following quotations: Stolberg, 13 1/4 guilders; Spanish, 13 1/4, and the various common German brands, 13 1/8. *Spelter* is strong at 18 to 19 guilders for Silesian. All the foregoing quotations are understood to be the 50 kilos.

EAST INDIES.

(*Schmidt, Kustermann & Co*).

PENANG, Aug. 25, 1875.—*Tin* opened with an active inquiry for China at $21·40 per picul, but shortly afterward declined to $21·25. Better advices from London caused prices to advance again to $21·75, which was the closing quotation on the departure of last mail. Since then only trifling purchases have been made at $21·25 to $21·45. The market closes firmer at $21·50 per picul. *Tonnage.*—No change to be noticed. Dead weight remains scarce as before. On the coast there is little offering, and only low offers are obtainable. The sterling rate for *Exchange* continued in its downward tendency until departure of last mail, for which the local banks were drawing at 4/1 1/8. Since then rates have slightly hardened, and close, for credits and documents, 4/1 1/8 to 4/1 3/8.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

SHEFFIELD, ENG., Oct. 4, 1875.

ANOTHER DIFFICULTY IN WALES.

South Wales would appear to be the chosen battle ground whereon the great industrial fights of the day are waged with but little intermission. No sooner has one dispute been disposed of than another *casus belli* arises and the combatants are hurled together with all the fierce force which a sudden quarrel generates. Of late the employers have been the first to throw down the glove, but it must be admitted that the men have never been very slow to accept the gage of strife, and have conducted their forces throughout a very intricate and difficult series of manœuvres with no little skill and hardihood, even though they have been worsted in the main issues. It will be quite fresh in the memories of those who take any interest in British affairs—and I take it that most of your readers do so—that not further back than the spring of the present year a gigantic pitched battle took place between the Welsh colliery proprietors and the miners in their employment, and that the contest was one of the most prolonged and most bitter that the world has ever witnessed. Last year the iron masters and their men had a similar tussle, with a like result to that just mentioned. Now there is a further difficulty, and one, too, of a very obtrusive nature. On Saturday, "to wit," the iron masters of Monmouthshire and South Wales posted up notices in all their establishments terminating all contracts in the iron works at the expiration of October. There is, of course, only one interpretation to be given to this proceeding, which is that it means a further reduction in wages. The masters will meet during the present week, but their precise intentions are unknown, and their gatherings are mostly held in private. I presume they intend to enforce a drop, believing that in the existing disorganized condition of the Iron Workers' Association they will have a very good chance of succeeding, particularly as the trade remains very dull in all directions.

THE COST OF LABOR

appears still to be growing in many branches of industry, and especially so on the great lines of railway in this country. The Northeastern line, for instance, now pays not less than one and a half millions, yearly, for wages—or precisely double the sum total paid five years ago, and only a very small proportion is due to the increased number of train miles run. The officials of that line have furnished, for the first time, the following comparative tabular statement, detailing the gradual augmentation of the cost of wages (not including salaries) during the period named, in separate items for the first and latter half of each year:

	First Half.	Last Half.
1870	£305,817	£441,001
1871	390,999	511,905
1872	511,909	581,005
1873	594,680	671,205
1874	673,599	750,373
1875	745,632	......

These enormous amounts *for wages alone* give one some idea of the tremendous burdens borne by the railway companies here, as well as of the bulky business done in order to bring in a corresponding revenue. It will be remembered, too, that the Northeastern is by no means our largest railway system. Unlike wages, however,

THE COST OF FUEL

to the railway companies is now much less than it was in the panic period. The Midland Railway Company, as an example, paid £207,164 for coal and coke during the half year ending June 30th, 1874, but for the half year ending June 30th, 1875—that is, this year—they only paid £150,107, a very striking reduction when it is taken into consideration that over 700,000 additional train miles were run. The Northeastern, which I again quote as a very pertinent example of what I am pointing out, figures in this respect are these:

	Cost of coal and coke.
December, 1871	£85,313
June, 1872	102,388
December, 1872	168,875
June, 1873	212,419
December, 1873	232,942
June, 1874	213,960
December, 1874	186,482
June, 1875	165,272

The effect of these combined causes on the Northeastern dividends was that the last dividend in 1872 was 9 1/4 per cent.; first in 1873, 8 1/4; second in 1873, 10; first in 1874, 7 1/4; second in 1874, 9 1/4; and first this year, 8 1/4. This particular company, I may say, revenged itself by raising its traffic rates to the coal owners and coke producers.

THE SCOTCH PIG IRON MARKET

has been animated, not to say excited, during the week, owing to the persistent operations of a knot of speculators in warrants, who appear to have combined to rig the market. In this they have only been partially successful, but they have, nevertheless, contrived to send up warrant quotations to 69/3—an advance on the week of nearly 3/ per ton. Many brands of makers' iron are also higher, although it is no secret that large quantities of almost any description may be bought under the quoted figures. Connal's stores have received over 5000 tons more during the six days—making the present stock there 65,705 tons—an augmentation which is comprehensible on the supposition that those who have sold have sent in the iron in order to "make" warrants to meet their engagements at the current settlement. The shipments amounted to 10,164; a decrease of 1195 as compared with the corresponding week of last year. I notice that there has been a reduction of freights from Glasgow to New York, the figures being now 2/6 only. There are, I may mention, 116 furnaces in blast and 30 out. Writing on October 1st, evening, Messrs. James Watson & Co. (Glasgow), said: "There has been considerable animation in the warrant market this week consequent on the operations of speculators, the price having advanced from 66/9 to 69/4 1/2 cash, closing easier at 68/9, sellers." We quote makers' brands:

	No. 1.	No. 3.
G. M. B., at Glasgow	68/6	66/6
Gartsherrie, "	73/	66/6
Coltness, "	83/	68/6
Summerlee, "	68/6	66/6
Langloan, "	78/	67/
Carnbroe, "	69/	66/6
Calder, at Port Dundas	76/	66/6
Glengarnock, at Ardrossan	71/	67/
Eglinton, "	67/	66/
Dalmellington, "	67/6	66/6
Shotts, at Leith	78/	67/6
Kinneil at Boness	66/6	63/

Messrs. Wm. Colvin & Co. (Glasgow), Oct. 5th, write: "The market for warrants continued to show firmness during the latter part of the past week, on account of open contracts being called up, and the consequent pressure for immediate delivery, the price ranging between 69/3 and 68/ cash. Yesterday the tone was quieter, and business was done from 68/6 to 67/6. To-day business was done from 67/6 to 66/6 cash, closing with sellers at 66/6 cash, and 66/ one month fixed. The deliveries of iron into store continue at a good rate, and the quantity now there is over 70,000 tons. The value of makers' iron is necessarily somewhat irregular. The Middlesbro' market to-day is reported firm on account of a decided reduction in stock during the month of September." We quote:

	Deliverable alongside. No. 1.	No. 3.
G. M. B., at Glasgow	67/6	65/6
Gartsherrie "	75/6	66/6
Coltness, "	80/	67/6
Summerlee, "	69/	66/
Langloan, "	78/	66/
Carnbroe, "	69/	66/
Monkland "	67/6	65/6
Clyde "	67/6	65/6
Goven, at Broomielaw	67/6	65/6
Calder, at Port Dundas	77/6	66/6
Glengarnock, at Ardrossan	71/	66/6
Eglinton, "	66/	65/
Dalmellington, "	67/6	66/
Carron, at Grangemouth	67/6	..
Carron, " specially selected	70/	..
Shotts, at Leith	78/6	67/6
Kinneil, at Bo'ness	66/	63/
Bar Iron	£8. 0/ to £8. 10/	
Nail Rods	£9. 0/.	

SHIPMENTS.

	Tons.
Week ending Oct. 3, 1874	11,562
" Oct. 2, 1875	10,870
Decrease	692
Total Increase for 1875	87,660

Messrs. John E. Swan & Brothers, Glasgow, Oct 1, says:

Glasgow Brands.	Furnaces B'wing. 116	Furnaces Out 30.	Furnaces Built. 154.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	13	3	16	77/6	66/	..
Coltness	12	0	12	..	67/	..
Summerlee	6	1	8	69/	66/	66/
Langloan	7	0	8	78/	66/	65/
Govan	4	0	5	68/	66/	65/
Calder	3	1	7	*77/	66/	65/
Shotts { Bess'mer	2	0	2	80/	..	..
Shotts { Ordinary	3	1	4	78/	67/	..
Carnbroe	4	2	6	69/	66/	65/
Wishaw	2	0	3	..	..	..
Monkland	6	0	6	68/	66/	..
Chapelhall	3	0	3	71/	..	..
Clyde	5	0	6	68/	66/	..
Quarter-Clyde	4	0	4	68/	66/	..

* f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 68/.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock	7	2	9	70/6	66/6	65/6
Ardeer	4	1	5			
Eglinton (Brand'd Eglint'n)	6	2	8	66/6	65/	66/
Lugar (Brand'd Eglint'n)	4	0	4			
Muirkirk (Brand'd Eglint'n)	3	0	3			
Portland (Brand'd Eglint'n)	3	3	6			
Dalmellington	6	2	8	67/	66/	60/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil	3	1	4	67/	63/	60/
Almond	2	1	3	66/	63/	60/
Carron { Selct'd	4	2	6	70/	..	..
Carron { Ordn'y				67/6	..	..
Lochgelly	0	4	4	..	..	..
Lumphinnans	0	2	2	..	..	..
Bridgeness	0	2	2	..	..	..

TRADES OF SHEFFIELD.

The iron trade generally is quite as dull and uneventful as when last reported upon. There has been no movement of real importance during the week, the various matters to be referred to hereinafter being scarcely entitled to rank under that heading. The general manufactured iron departments are still listless and apathetic to a degree which is almost wholly unprecedented in the history of the district. Few of the merchants are able to effect sales of ordinary merchant iron, the only brands which meet with anything like a ready sale being the best Yorkshire irons of the Leeds and Bradford district, Kirkstall Forge, Low Moor and Bowling. The Butterley Company's productions are not in request, although their girders and certain other specialties rank high in the estimation of engineers and architects. Some of the founders, it is true, are doing what may, under existing circumstances, be termed a fairly good amount of business in the classes of articles enumerated in these notes last week; but there is good reason for supposing that the rates at which the smaller establishments have undertaken the work will leave but a very bare margin of profit. The larger works in this line are, of course, better off. They have their own coal and ironstone, and make their own pig iron, so that, by having all the processes in their own hands, they can—indeed, must—afford to be content with a moderate ultimate gain. Even in these instances prices are being cut very fine, not only by local competition, but by the strenuous efforts which firms or companies in other districts are making to secure such specifications as are from time to time put forth. In a recent instance which came under my own observation, a large concern in the North of England sent in tenders for a large lot of iron work of a certain class at figures which were fully 2/6 per ton lower than the offer of firms in the vicinity of this town, delivered in each case. I hear of pipes of large diameter being obtained at something like £6 per ton. Pig iron has changed hands during the week in small lots, a fairly good foundry quality being vended at 56/ to 58/ per ton. Forge pigs are not in much request. In hematite irons the sales are not at present on a large scale, and as a natural consequence there have been further reductions of quotations of some brands since I last wrote. For instance, Maryport hematite, No. 3, is now 70/; No. 4, 70/; No. 5, mottled and white, each 70/, as against 77/6 last quoted; Bessemer No. 1, 77/6; No. 2, 75/, and No. 3, 75/ per ton, all 2/6 down. Millom Bessemer, No. 1, is 80/; No. 2, 77/6; and No. 3, 75/; ordinary No. 3, 75; No. 4, 74/; No. 5, 75/; mottled 80/, and white, 75/, all per ton. The cast steel manufacturers are not doing a very large business, although, as I have stated several times of late, the special steels of some of the chief old-established firms are selling with some freedom for America, France and the home markets.

The gun works are only moderately well engaged, mostly on cores, &c., for our own government, or for France and Italy. The steel castings for half a dozen 100 ton guns to be made by Sir W. Armstrong & Co. for the Italian government are being made here.

The railway wagon manufacturers are doing a steadily good business, the recent and current great extensions of colliery and iron works enterprise having caused a growing and large demand for wagons, suited for the traffic arising in consequence thereof. The engineering establishments are rather irregularly engaged at present, some of them having good commissions in hand, while others lack orders in a very marked degree; the Yorkshire Engine Works are, I understand, still turning out Fairlie bogie engines for Peru and elsewhere, and are doing pretty well with their Perkins' patent engines.

The steam plowing works at Leeds are doing a good business, as also are several houses at Barnsley and Sheffield in special tools. The Round Foundry, chiefly owned by Messrs. Smith, Beacock & Tannett, at Leeds, was nearly destroyed by fire on Tuesday night, the damage being estimated at £30,000. Over 1000 men are thrown out of employment. The buildings were four stories in hight, were used as a light tool manufactory, &c., and were erected a good many years back by the well known Matthew Murray.

The members of the North of England Institute of Engineers will visit Leeds on October 13, and Barnsley and Sheffield on October 14 and 15 respectively. They will visit all the leading collieries and iron works at each place, and there will be a dinner each evening at 6 o'clock.

The dispute at the Parkgate Iron Works is still unsettled, and likely to remain so. The men are appealing to other districts for sympathy and support. The dispute at the Roundwood Colliery, Rotherham, has been settled by a compromise, but other troubles have arisen at some of the neighboring collieries.

A petition in bankruptcy has been filed in the Sheffield County Court by Messrs. Marsden & Stokes, carrying on business as iron and steel merchants in Broad street, Sheffield. The liabilities are set down at between £5000 and £6000, and the assets are probably three-fourths that amount. Mr. Kidd Percy, Charlton Iron Company, has been appointed trustee. Mr. Taylor, Sheffield, dealer in art bronzes, &c., has filed a petition—liabilities £5000.

The cutlery manufacturers are still not very briskly engaged, with the few exceptions of those who have good brands or special qualities to fall back upon in the absence of ordinary orders. A good deal of interest has been excited by the fact that

GEORGE WOSTENHOLM & CO. (LIMITED)

has been, or, I should say, is being, created out of the well known firm of George Wostenholm & Son. Everybody knows that George Wostenholm & Son have carried on business at the Washington Works, Wellington street, Sheffield, and that their double carbonized "IXL" mark is held in high estimation in the United States, as well as in this country. The capital of the new company is £100,000 in 1000 shares of £100 each, £20 of which are to be paid on allotment, and a further £10 per annum until £70 per share has been paid. The vendor, Mr. George Wostenholm, guarantees a minimum dividend of 10 per cent. for a period of five years. I may just add that Mr. Wostenholm will be the chairman and managing director, and that among the other directors will be Mr. Thomas Jessup, a sterling business man, and Mr. Bernard Wake. It is said that there are already more applications for shares than can be satisfied. About 1000 hands are employed at the works, and there is no doubt that the business is capable of being extended.

UNWIN & RODGERS (LIMITED).

This also is a new Sheffield "limited" company formed to acquire and carry on an old established cutlery business. Messrs. Unwin & Rodgers have long carried on business at the Globe Works, Penistone Road, Sheffield. The capital of the company is £40,000, in 8000 shares of £5 each. The purchase money for the land, works, &c., is £26,000, the vendor to receive £3000 in cash, and leave £18,500 upon mortgage, the balance of the purchase money to be taken in fully paid up shares in the company. The stock, tools, &c., will be taken at a valuation. The profits realized by the firm for some years past are said to have been 15 to 17½ per cent.

SINGULAR ERROR IN THE TRADES MARKS BILL.

The Sheffield *Daily Telegraph* has the following: "We understand that in the passage of the Trades Marks bill from the Commons to the Lords, the word 'any' has been somehow omitted. This little word, unimportant as it may appear, may have a serious effect on nearly 2500 local trade marks. The wording of the clause, as suggested by the Cutlers' Company, defined a trade mark as any distinctive symbol or *any* combination of letters or figures. The second 'any' is omitted; and the act as it stands, therefore, requires the trade mark to be a distinctive combination of letters or figures. Many Sheffield merchants use letters as a trade mark, and if the act is interpreted according to its letter, and not to its spirit, the trade marks of many Sheffield manufacturers would be placed in a peculiar position. Mr. Mundella, M. P., who had a good deal to do with the insertion of the clause required by the Cutlers' Company, will doubtless be asked to introduce a new act to amend this singular error."

BIRMINGHAM AND THE UNITED STATES.

I am indebted to Mr. Gould, United States Consul, at Birmingham, for the following correct statement of business done with the United States from the Birmingham district during the four quarters of the year ending September, 30th, 1875:

	Ending Dec. 30.	Ending Mar. 30.	Ending June 30.	Ending Sept. 30.	Total.
	£.	£.	£.	£.	£.
Hardware, cutlery, steel, iron	49,762	44,410	27,763	42,316	165,253
Sheathing metal	2,598	82	224	1,903	4,807
Iron bale hoops	13,541	568	7,905	10,434	32,448
Anvils & vises	3,152	2,405	2,993	2,014	10,565
Tin plates	7,830	1,065	1,538	539	10,973
Chains & hoes	20,454	17,228	2,708	7,035	47,422
Sad'l'ry & skins	3,014	3,330	3,081	5,000	14,426
Guns & implements	19,659	18,525	31,790	43,450	113,427
Needles & buttons	14,939	20,925	13,264	19,580	68,709
Chemicals and phosphorus	6,788	7,240	8,228	10,953	33,210
Boot materials	3,439	5,403	2,310	2,383	13,536
Glassware	8,560	3,711	3,586	4,071	19,930
Pens and tips	5,070	5,096	5,325	3,683	19,174
Fancy goods, jewels, watches	24,291	12,725	14,670	20,033	71,721
Sundries	7,279	3,155	2,104	4,281	16,820
Total for Birmingham	189,683	145,869	130,495	177,660	643,708
Leic'st'r agency	28,925	37,950	15,094	31,008	112,979
Kidderminster agency	13,008	15,208	1,582	19,137	48,937
Wolverhampton agency	15,161	9,655	9,730	7,028	41,576
Redditch ag'ncy	28,337	48,225	30,885	29,889	137,337
Total for Birmingham and district	275,116	256,909	187,788	264,724	984,539

Total for Birmingham and district for the year ending September, 30, 1874......£1,187,497

BIRMINGHAM AND STAFFORDSHIRE.

There is no material alteration to note in connection with these localities since I last wrote, the iron trade being, as usual, very quiet at the end of the quarter. At the finished iron works some pressure is being exerted in order to get shipping orders out of hand, and there is, consequently, a temporary and phenomenal scarcity of labor at some of the larger establishments. All quotations for iron are steadily firm from this cause, and owing to the apprehension that coal is again becoming dearer, hence it is very uncertain indeed what course may be taken by the iron masters at this week's quarterly meetings. A reduction appears to be highly improbable, yet there are people to be found who are "confident" that at least 10/ per ton must be taken off the list price of bars if any business worthy of the name is intended to be done between now and Christmas. Such a drop may be declared, but I think it somewhat improbable, and shall not be very greatly surprised to learn that an advance of similar amount is intimated. The hardware branches of industry are fairly well employed, particularly the tool, jewelry, hollow ware, tinned and enameled goods, and copper trades. There is also a steady run upon buttons, brass and iron bedsteads and gas fittings.

SOUTH WALES,

in some of its unfortunate aspects, has been referred to in another portion of this communication, to which I will not, in consequence, again allude in detail. The iron works are still doing very little business, there being but a few light orders for iron rails in hand. These are being executed at a trifle under £7 per ton. Steel rails are quoted £9, f. o. b. Cardiff or Newport. The rails made are for Italy, Russia, Finland and South America. There is very little doing in tin plates, the prices of which are very low indeed.

THE METAL MARKETS

were rather unsettled at the beginning of the week, but later on grew steadier, and a few good transactions resulted. Messrs. Von Dadelszen & North, say: "*Copper.*—A considerable amount of business has been done, at an advance of 20/ per ton in Chili bars, which are now quoted £82. 10/, cash, for g. o. b., and 10/ extra for named brands. There being very little available Australian copper, prices are quoted nominal, viz.: Wallaroo, £93; Burra, £89. 10/. English fairly steady. *Tin.*—A large business has taken place since our last, and at one time an important advance in price was established, which, however, has not been maintained. Straits changed hands from £83 to £88, cash, and up to £87 for forward delivery and shipment, but is now fully £2 per ton lower both spot and forward. Australian, after touching £85, has given way to £84, sellers. The 22,990 slabs Banca tin, offered in public sale on the 29th ult., realized 52¾fl., equal to about £90. 10/ laid down here. Billiton is quoted 50½fl. English firm. Tin plates are unaltered in price, and the demand is no better. *Lead* is, if anything, a little quieter; £23 the price for good soft English pig. *Spelter.*—Nothing officially reported. The market is steady, at £25 Silesian, spot and forward; special brands, £25. 10/. *Quicksilver.*—£14. 10/ per bottle.

The *Mining Journal* remarks: "*Copper.*—The market opened quiet at the beginning of the week, and Chili bars, g. o. b., were dealt in in small parcels at £81. 10/ to £81. 15/, usual cash terms, and best brands, £83. On Tuesday the market stiffened, and a larger business was effected at slightly advanced quotations. G. o. b., £82, and Lota at Swansea, £82. 5/, cash; and g. o. b., with long prompts, £81. 15/. On Wednesday the improvement of the previous days was maintained, and business became more general. G. o. b. again changed hands at £82; named brands, £82. 10/ to £82. 15/; and best brands, £84, cash. Yesterday a cargo of ore realized 16/6, and regulus, 17/. Chili bars were sold, g. o. b., £82. 5/ to £82. 10/, cash. To-day the market is firm, but without any material alteration in the price of bars. Tough is quoted £88; best select, £90; strong sheets, £95; India sheets, £94, and yellow metal, 7¾ to 8¼. *Lead.*—The market has been quiet but firm, and no alteration in the rates has taken place. Good soft English pig, £23 to £23. 5/; soft Spanish, without silver, £22. 15/. *Spelter.*—Silesian rules about £25. Stock in London on Sept. 30, only 82 tons. *Quicksilver.*—Business has been done at £14. 10/, at which quotation the market closes. *Tin.*—The market has been strong throughout the week, with some little fluctuation, and the Dutch Trading Company's sale of 22,900 slabs of Banca has gone off without animation at 54¼fl. to 52¼fl., average 52¾fl., or equal to about £90. 10/, laid down here. Straits rule at about £86; Australian, £84. *Tin Plates.*—There may be a little more doing in tin plates, but the trade is still very dull."

Messrs. J. Berger Spence & Co.'s circular to-day reports: "Copper is again firmer, and a large business may be reported, at an advance of 20/ to 30/ upon last week's quotations. At the Swansea sale, on the 28th ultimo, Bolivian ore and Regulus realized 16/3 and 16/9 respectively; while 100 tons Chilian Regulus, to arrive, were disposed of at 17/ per unit. The transactions in tin have been of a very animated character until within the last few days, when a reaction set in, and quotations receded from £88 to £85. 10/ for Straits. Lead is steady at previous rates, while spelter remains firm and unchanged."

Messrs. Vivian, Bond & Watson (Liverpool) say: "*Copper.*—In the early part of the past fortnight the market gave way somewhat, a few transactions in bars taking place at £81 to £81. 10/. Our Liverpool holders did not, however, meet the market, and little or no copper changed hands here at the decline. For the last few days a large business has been done at £82 to £82. 10/ spot and afloat for g.o.b.'s, and up to £83 to £83. 10/ for choice and best brands. In furnace material a cargo of Bolivian ore and regulus, to arrive at Swansea, sold at 16/3 for ore and 16/9 for regulus, and 100 tons Chili regulus to arrive for here at 17/ per unit. At the Swansea sale, 28th inst., 951 tons ore, average produce, 21¼ per cent., sold at an average of 16/6 per unit, the Cape ore averaging 22⅜ per cent., bringing 16/8½ per unit. The Chili charters for first half of this month were advised by cable, 16th inst., as 2400 tons fine, viz., 1300 tons bars and ingots and 900 tons fine ores and regulus, for England, 100 tons bars for the Continent, and 200 tons in bars for the United States. *Tin.*—The market has been helped by speculators, and is about £5 per ton dearer during the fortnight, Straits having sold as high as £86, cash; Australian, £84; and English ingots, £90 to £91. Little or nothing done in Peruvian; value, £73 to £77. The Banca sale yesterday went rather slow; average, 52⅜ florins, equal to about 91/ laid down in London. The market was rather quieter at the close."

Messrs. Harrington, Horan & Co. (Liverpool): "Arrivals here during the fortnight, of West Coast, S. A., produce—Aconcagua, from Valparaiso, 247 tons bars, 300 tons ingots, 5 tons Barilla; Maravilla, from Valparaiso, 135 tons bars; Grace Gibson, from Valparaiso, 15 tons bars; Montezuma, from Valparaiso, 10 tons bars; South Glen, from Valparaiso, 17 tons bars; American, from Colon, 31 tons bars. At Swansea—Alpha, from Pena Blanca, 585 tons regulus; Pacific, from Gatico, 610 tons ores; Lord Marmion, from Lota, 725 tons bars; Hawkeye, from Carrizal, 740 tons regulus; Epsilon, from Tocopilla, 360 tons ores, 450 tons regulus. Stocks of copper (Chilian Bolivian) in first and second hands, likely to be available, we estimate at:

	Ores.	Regulus.	Bars.	Ingots.	Barilla
Liverpool	..	...	9,663	628	...
Swansea	..	979	2,474	...	...
Total..		979	12,137	628	

representing about 13,206 tons fine copper, against 13,475 tons Sept. 15; 15,500 tons, Sept. 30, 1874; 20,600 tons, Sept. 30, 1873; 21,000 tons, Sept. 30, 1872. Stock of Chili copper in Havre, 15,000 tons fine. Stocks of Chili copper afloat and chartered to date, 13,168 tons fine."

Latest Liverpool iron and metal prices are:

Iron: f. o. b. in Liverpool, per ton.

	£	s.	d.		£	s.	d.
Merchant bar	7	17	6	@	8	5	0
Merchant bar, in Wales	7	7	6	@	7	15	0
Staffordshire	8	10	0	@	11	15	0
Hoop	9	15	0	@	10	15	0
Sheet	11	5	0	@	11	15	0
Nail rod	8	15	0	@	9	5	0
Bar, best crown	8	10	0	@	8	15	0
Boiler plates	11	5	0	@	12	0	0

Tin Plates: f. o. b. in Liverpool, per box.

	£	s.	d.		£	s.	d.
Charcoal, I. C	1	7	0	@	1	10	0
Coke, I. C	1	2	0	@	1	4	0

Copper: Delivered in Liverpool, per ton.

	£	s.	d.		£	s.	d.
Bolt and Sheathing	93	0	0	@	94	0	0
Tile	88	0	0	@	90	0	0
Tough cake	87	0	0	@	89	0	0
Best selected	90	0	0	@	91	0	0

Fair of the American Institute.

We find on taking a careful survey of the Fair that our first estimate of it is by no means a wrong one. Several novelties have come in since our last visit, and others have been set up and got ready for exhibition. The exhibit of W. L. Chase & Co., of 95 and 97 Liberty street, is especially worthy of notice. Among the articles are a number of Stiles & Parker presses, one of which we illustrate on the first page of this issue. We also note a new drawing press driven by a cam motion and crank. The motions are so combined as to give a very quick return motion. The press has an adjustment to regulate the length of stroke, patent stop motion, and is back geared. A friction roll drop press with N. C. Stiles' improvements is also on exhibition. It seems particularly suited for light metal work. A number of foot lathes made by W. L. Chase & Co. are especially worth attention for beauty and accuracy of workmanship and convenience. They are made up in five sizes, with 8 or 6 inches swing, and various lengths of bed. Another article in this exhibit is well worth notice, a "No. 4 double press," by Stiles & Parker, intended for shearing and punching. It will punch a three-quarter inch hole in three quarter inch iron 18½ inches from the edge.

B. L. Ackerman, 317 and 319 West 44th street, has a case of automatic screw wrenches, which, from appearances, and a drawing of the construction, we should judge were of considerable value. The workmanship seemed very good.

H. Hammond, of Hartford, Conn., has a very pretty casefull of steel and iron drop forgings and hammers in different stages of manufacture. Many of them resembled fine castings rather than forgings, and even on close examination they seemed rather like articles cast in a mold than brought up under a drop.

H. A. Rogers, 19 John street, exhibits a case of very fine taps and dies, and tap wrenches by Pratt & Whitney, of Hartford, Conn. These tools have many new features in the way of holding and adjusting the dies, and in the shape of the dies themselves. The chief feature of the exhibit is a new screw cutting machine for threading bolts; this, if we are not mistaken, is the first machine of the pattern that has been put into the market. It is very convenient and finely finished.

G. & H. Barnett File Works have a very fine case of files. The establishment is represented in this city by Thomas Taylor, 43 Chambers street.

George Place, 121 Chambers street, has a very large and interesting exhibit, consisting of a Harris Corliss steam engine, lathes, cold rolled shafting, vertical drills, bolt cutter, car wheel borer, forges, band and circular saws, pulleys and hangers. Altogether this is one of the largest exhibits of the Fair, and is very showy. The machines themselves are of high class both in design and workmanship.

Some Recent Developments in the Technology of Iron.

Furnace Capacity and its Economical Aspects in England.

It would be futile to attempt to determine with any precision the dimensions of the primitive blast furnace, or even at what period it was discovered that there were certain advantages to be gained by aiming at the production of a metal which could be run in a fluid mass from the hearth, over the original method of producing a nearly infusible bloom of malleable iron direct from the ore. It is probable that the wolf furnace, or *blaufen* (the highest development of the first rough ore-hearth), in which the metal was reduced into a steely mass, requiring to be extracted bodily from the furnace crucible, gradually attained such dimensions that the reduced metal in its descent through the longer column of fuel became sufficiently carburized to constitute an easily fusible metal or charcoal pig. It would soon be discovered that tapping a fluid was an easier process than hewing and dragging out the wolf, and the blast furnace and its product have established their place in metallurgy.

It appears that the blast furnace was introduced into England from the Continent about the reign of Edward IV., though there is some evidence of a knowledge of cast iron a century before. The early cannon used by Edward III. in his French wars, which Scrivenor apparently regards as the first examples of casting, were unquestionably constructed of *malleable* iron, being built up of bars round a central core, on the same system which has been recently successfully resuscitated. Camden, however, writing in the reign of Elizabeth, makes special mention of the casting of cannon as one of the leading industries of Sussex. The parents of the monster structures in which the extraction of iron is now conducted, were apparently about 12 feet high and of a proportionately small diameter, and these very moderate dimensions were only very cautiously extended. The difficulty of maintaining a blast, with the inadequate apparatus then available, powerful enough to penetrate a considerable column of materials, for at least a couple of centuries rendered a hight of 25 or 30 feet the maximum attainable. So lately as the end of the last century 35 to 38 feet was the normal hight in England, while the charcoal furnaces of the Continent were on a correspondingly smaller scale.

In 1790 the average annual production of pig per furnace was in England a trifle over 1000 tons, though in Scotland the celebrated Carron Works turned out over 1500 tons per furnace. In France, at the commencement of the present century, there was but a single coke furnace—that of Creusot—in existence. For the next fifty years there was a gradual increase in the average capacity of the blast furnace, though in no proportion to the growth of the trade, which in the same period had increased tenfold. Scrivenor estimates the average dimensions at the end of the first decade of the century as 40 feet in hight, 11 feet in the boshes, and 3½ feet at the tunnel head. In 1830, according to Gruner, the average capacity in England was 2000 cubic feet, and in Wales from 2300 to 2500 cubic feet. There was, however, then in existence at Dowlais a furnace of 8200 feet capacity, though Mushet speaks of the Plymouth furnaces 40 feet high, 18 feet in diameter and with 7000 cubic feet capacity, making 120 tons a week, as the largest in South Wales. Between the years 1806 and 1847 it appears that the average production of the English blast furnace had increased from 1540 tons to 4500 tons per annum, but the whole of this increase, or even the greater part of it, cannot be assigned to increased dimensions, for in the interval the hot blast and improved blast engines worked by steam power had enormously increased the productive power of the old furnace.

From the year 1851, in which the first Cleveland furnace was erected, with a hight of 42 feet and 15 feet boshes, the history of the further development of the blast furnace merges into an account of the gradual enlargement of almost each successive furnace built in the Cleveland district. In 1853 Bolckow and Vaughan's second series of furnaces were constructed, with a hight of 54 feet, boshes of 15 feet and a capacity of 7166 cubic feet. Just ten years after the first furnace of the district had been blown in, a new impulse to the progressive increase in size was given by the success of a furnace having, with a hight of 60 feet, the hitherto unparalleled capacity of nearly 13,000 cubic feet. In another five years 20,000 cubic feet capacity and 75 feet in hight had been attained. In 1868 Bolckow and Vaughan again came to the front with their 95½ feet furnaces, having a capacity of 28,800 cubic feet. But still higher structures were in progress; Cochrane's Ormesby furnaces, with a hight of 92 feet, unite a capacity of 41,000 cubic feet and 42,500 cubic feet respectively; but even these have been eclipsed by the giant furnaces of Ferryhill, of which the earlier group exceed 102 feet in hight, while the culminating magnitude is reached by the new Ferryhill furnace, 105 feet high with 33 feet boshes, and a capacity of over 50,000 cubic feet.

The energetic Cleveland metallurgists have been followed in their vigorous enterprise by other districts, only with very hesitating steps. In Lancashire and Cumberland some 70 feet furnaces have been erected, but the majority of the western coast iron masters adhere to 55 or 60 feet as the maximum hight. In Staffordshire, though it has been demonstrated in more than one instance that the maximum profitable dimensions have not been reached, it is doubtful if the last quarter of a century, which has seen the north of England furnaces increase their dimensions fourfold, has increased the average capacity of the Staffordshire furnace by 50 per cent. At Lilleshail, in Shropshire, an old furnace hightened to 71 feet might, by its excellent performance, have encouraged contiguous works to a bolder policy. In West Yorkshire the fact of the Bowling Company having blown in a furnace of 55 feet is considered noteworthy. In the new iron district of central England a good start has been made with a 70 foot furnace. In Wales the iron masters have proved so strictly conservative that a 55 foot furnace at Dowlais, with a little over 8000 cubic feet capacity, still holds the lead, as it did 50 years ago. It would seem, nevertheless, that this adherence to the old type is not altogether blind, since from this very furnace as much as 500 tons of Bessemer pig has been lately run in a week. A 70 foot stack at the Victoria Works, near Tredegar, is reported to give unsatisfactory results. We also hear of a 60 foot stack being put up ten years ago by the Ebbw Vale Company, which had a capacity of 16,000 cubic feet. In Scotland the limit of 62 feet has, so far as we are aware, been exceeded only by the Ferrie furnaces (of which more will be said later), and the Almond and Summerlee stacks.

On the Continent the dimensions adopted, even in recent years, differ very widely. Excluding charcoal furnaces, which are necessarily of inferior magnitude, it would appear that 50 feet is the greatest average hight; though in Luxenburg we have furnaces of 65 feet, in Moravia 61 feet, in Belgium of 60 feet, at Creusot of 54 feet, at Marseilles of 60 feet, and others of equal, and exceptionally of greater hight. The tendency to gradual and cautious enlargement may be illustrated by the history of the Glewitz furnaces, as recorded in the pages of *Iron*, while at the Kœnigshutte Works we find stacks increasing from 38 feet in 1829 to 47 feet in 1855 and to 48 feet in 1865, but decreasing to 43 feet in 1872; the capacity for the same furnaces being 1500, 4400, 6600 and 7500 cubic feet respectively. A 20 foot bosh is rarely, if ever, met with in Continental practice, though we find a 50 foot furnace 18 feet in the boshes.

In America—the quarter whence we have most to fear severe competition—a natural love for "bigness" has, perhaps, assisted their appreciation of the advantages of magnitude in blast furnace economy. Be this as it may, it is certain that in the years immediately preceding the crisis, which proved so disastrous to an industry which protection had fostered into an astonishing but unsubstantial prosperity, numerous furnaces of extensive proportions sprang up in all quarters of the States. The change in opinion which led to their construction was even more rapid than in England. Till a few years back it was held that the maximum hight for a coke furnace was 50 feet, and for an anthracite furnace 5 or 6 feet less. About the year 1863, however, it appears from Percy's work that in the Lehigh district there were furnaces of 60 feet, with 14 to 22 feet boshes; though the Thomas furnace, which Dr. Percy speaks of as pre-eminent "for beauty, size and convenience of build," with a hight of considerably less than 55 feet united a width at the bosh of 18 feet. How considerably these measurements have been recently exceeded will be perceived from the following list of some modern stacks:

	Scranton.	Isabella 1 and 2.	Alleghany.	Cambria.	Frank-lin. N. J.	Stan-hope, N. J.
Hight in feet....	80	75	75	75	67	80
Width of bosh....	23	18	20	20	23	....
Capacity cubic feet....	—	12,800	14,000	15,000	....	16,400

In the last half century it has been calculated that the average hight of the Pennsylvania furnaces has increased from 40 to 60 feet, or 50 per cent., while the average diameter has increased in equal proportions. In the Western States there are several furnaces of 15,000 cubic feet, Chicago boasting of at least two of 17,500 cubic feet and 85 feet in hight. The palm, however, would be carried by the Carondelet stack of 100 feet hight and 25 feet diameter; but this has not, it is believed, ever been completed. In the Witherbee's furnace, New York State, of 65 feet hight, the American's certainly possess by far the largest charcoal furnace that has ever been built.

It should be remembered that the successive extensions of capacity, by which in one generation the maximum capacity of the Cleveland blast furnace has been increased eightfold, were not carried out as the result of theoretical investigations and under scientific advice, but that each advance was purely tentative, being based on the assumption that as all prior augmentations of capacity had proved advantageous, it might very possibly prove that a still further progression would be followed by similar success.

The average production of the best constructed furnaces in 1850 would hardly exceed 120 tons per week, while the Ferryhill Works are equal to a production of nearly five times that amount, and several of the Clarence furnaces turn out over 18,000 tons per annum, against the maximum 6000 tons of their predecessors.

In the United States the increase of productive capacity is equally marked. The Isabella furnace (No. 1) has made 112 tons of pig in 24 hours, and on several occasions, so far, maintained this rate as to make 700 tons per week. The Lucy furnace makes 475 tons of Bessemer pig in a week. Even the charcoal furnaces, recently built, frequently run 140 tons a week, while several exceed 175 tons a week.

On the Continent, probably the largest production is reached by the Esch-sur-Alzette works, which turn out, using a very lean ore, nearly 700 tons a week.

Though here, again, the whole increase of production is not due to increased size, but partly to improved methods of charging, a hotter blast and other subsidiary improvements. To these combined, causes, but mainly to the increased capacity, must also be ascribed an economy in Cleveland of 7 or 8 cwt. of coke per ton, and, according to Gjers, this has been accompanied by a notable improvement in quality "the pig iron being more highly carbonized and more uniformly soft throughout, than it originally was."

We have said that the Cleveland iron masters were guided rather by practical experience than scientific reasoning in the construction of their furnaces; and it is a curious illustration of the extent to which this thoroughly English adherence to practical, in preference to theoretical, deductions has been carried, that the more recent developments of blast furnace construction have been carried out in direct opposition to the warnings and vigorously enunciated opinions of one who is acknowledged to be the highest authority on the theory of blast furnace economy. Mr. Bell has throughout maintained that an increase of dimensions beyond 13,000 or 14,000 cubic feet is unnecessary and uneconomical; so that, on this basis, the most recent furnaces are at least thrice as large as sound judgement would dictate.—*Iron.*

The Newark Industrial Exposition.

The Newark Exposition, which for several years past has been gaining a very enviable reputation all over the country, has this year been extended in its scope to include the whole State of New Jersey. As usual, the exhibition is of a practical nature, the class of work shown being of a character to interest the practical man rather than to afford a brilliant show.

In the machine department, the first article to attract attention is a universal shaping machine and a gear cutter, by Ohl & Hauschild, 57 and 61 Passaic ave., East Newark. The first of these machines has some points worthy of

attention. The quick return and automatic feed are of the usual pattern, but the driving gear consists of a worm and wheel boxed in. The feed motion is obtained by means of a cam with a groove in it. Attached to the side of the shaper, but entirely out of the way, is a drilling machine fitted with a chuck for holding twist drills, which makes a very convenient arrangement. The gear cutter has a very large range of work. It cuts wheels with from 10 to 345 teeth, and has a range from a mere nothing up to something like 36 inches in diameter. Both machines are not only convenient but of high class in workmanship and finish, most of the surfaces of ways and guides being scraped true.

Pool & Co. have a very pretty case of perfectly true steel arbors, hardened to the depth of about 1-16 of an inch, and left soft inside. They also exhibit a tool for grinding these arbors. Howes & Phillips furnish the horizontal engine for driving the machinery, and also a 14 foot engine lathe, a universal shaping machine, and a case full of beautiful engine fittings.

At the time of our visit a Shapley engine was just going into position. The Passaic Machine Works have a shaping machine, a very neat, substantial upright engine, and a 12 foot connecting rod with straps, brasses, oil cups and keys complete—a very neat job.

Parkhurst & Gridley were exhibiting Jones, joint and mitre planer, a very neat and useful tool.

Zimmerman & Brown have a very good ornamental metal cornice. A very pretty exhibit of fire clay, fire brick and similar material is made by Jas. R. Savage & Co.

A very large and fine display of patent leathers is made by Reynolds & Wood.

P. Lessons steel wire bound boiler, finished with a wood jacket, made a pretty display.

Oscar Barnett has a large and handsome display of malleable iron castings.

Richardson & Bros. have a very large and handsome case of saws, and display a great variety.

John Charlton shows a case of chisels for carpenters.

Romer & Co. have a very fine case of padlocks and similar work.

Thos. Slaight has a case of locks, embracing a very great variety.

William Johnson has a case of carpenters, chisels of good style. The display of saddlery and saddlery hardware is very good. The display of carriages is also good and a good variety.

Chimneys.

A correspondent of the *Engineer* says: Our eye is ever and anon met by notices of house chimney casualities "when wintry winds do blow;" and lives there a man who, at such times, when sleeping near the slates, is not disquieted by a recollection of the fact that a tall chimney stack, till then forgotten, towers over his, as it were, devoted head. The question arises—Why are chimney accidents so frequent? A reference to our mechanical text-books leads us to the conclusion that chimneys are often too high, or, if they must be high, are too unsubstantial. Let us examine the question. The principles of the stability of masonry structures, applied to chimneys, show that the wind-pressure against the side of a chimney tends to force the mass to rotate round the leeward edge of one of the lower courses of masonry, while gravity tends to resist this motion. The general equation connecting the above forces is as follows:

Let P = equal the pressure of wind against the side of the chimney;
- p = the pressure of wind per unit of surface, say 50 lbs.;
- W = the weight of the mass of the chimney;
- w = the weight of the unit of mass, say 120 lbs.;
- A = the area of base of the chimney, out to out;
- A^1 = the area of the voids, or flues;
- h, b, t = the height, breadth and width respectively, of the chimney;
- q = the horizontal deviation of the resultant of the forces acting on the mass, measured from the middle of the base;
- q^1 = the horizontal deviation of the vertical let fall from the center of gravity of the mass, also from the middle of the base.

All units being in feet. Then—

$$\frac{P\,h}{2} = W\,t\,(q - q^1). \quad \ldots\ldots\ldots(1)$$

And as $P = p\,h\,b$, and $W = w\,h\,(A - A^1)$, this equation becomes

$$\frac{p\,h^2\,b}{2} = w\,h\,t\,(A - A^1)(q - q^1) \ldots(2)$$

Whence $$h = 2\,\frac{w}{p}\cdot\frac{t}{b}\,(A - A^1)\,(q - q^1) \ldots(3)$$

which may be called the limiting hight to which a chimney of certain dimensions, under given conditions, may be built.

To apply this practically, let us assume simple conditions. Let the mass be square in area, and let it fail by rotating on the outer edge of a bed course; also let it be vertical and rectangular. Then $b = t$, and $q = \frac{1}{6}$; also $q^1 = 0$.

Wherefore $h = 13{\cdot}5\,(A - A^1)$ ...... (3a)

If the materials of construction be bricks and mortar, the dimensions will probably be in units of half bricks, say $4\frac{1}{2}$ in. The following are, however, some dimensions from actual construction, and for these the values of h are worked out:

Flues 6 in. × 12 in., masonry 6 in. thick: $t = 24$ in., $b = 18$ in., ∴ $h = 8$ ft.
Flues 6 in. × 12 in., masonry 9 in. thick: $t = 30$ in., $b = 24$ in., ∴ $h = 13{\cdot}5$ ft.
Flues 9 in. × 9 in., masonry $4\frac{1}{2}$ in. thick: $t = 18$ in., $b = 18$ in., ∴ $h = 4{\cdot}05$ ft.
Flues 9 in. × 9 in., masonry 9 in. thick: $t = 27$ in., $b = 27$ in., ∴ $h = 10{\cdot}8$ ft.
Flues $13\frac{1}{2}$ in. × $13\frac{1}{2}$ in., masonry $4\frac{1}{2}$ in. thick. $t = 22\frac{1}{2}$ in., $b = 22\frac{1}{2}$ in., ∴ $h = 5{\cdot}4$ ft.
Flues $13\frac{1}{2}$ in. × $13\frac{1}{2}$ in., masonry 9 in. thick: $t = 31\frac{1}{2}$ in., $b = 22\frac{1}{2}$ in., ∴ $h = 13{\cdot}5$ ft.

We thus learn why tall chimneys fall on windy nights, and would warn architects and builders that no ordinary chimney is safe if over 10 ft. in hight. We have not exaggerated our data, or overdrawn our deductions. On the contrary, we have probably underrated the force of the wind, for Rankine gives the observed pressure in England to amount to 55 lb. a square foot. q also is taken at its extreme value, and assumes that the whole of the mortar of the plane of rupture is in tension—a thing never safe in practice, the proper limit being that pressure should increase from nothing at the windward edge to double the mean pressure at the leeward one. In this case q would be one third for square chimneys, and one-fourth for round. If this limit were adopted, the hights given above would be reduced one third. It will be no advantage to consider chimneys as containing a number of flues, for $A - A^1$ will always be less when there are a number of flues than when there is only one in the stalk, because there is one less crosswall in proportion. We see from the equations why heavy cornices add to the stability of a chimney, and why "pots" and "cowls" diminish it. Also it is clear that a plinth is desirable in a tall chimney stalk.

Recently we made known that certain of those English hardware manufacturers who are engaged in the japan trade were doing a good business in making japanned goods for Japan based upon Japanese patterns. We now note that the newest goods which are going out from the manufactories of those Japan firms who lead the trade in art products, bear the stamp of new taste as to embellishments upon products required for use or ornament upon the table. This is seen, not alone in the conventionalized Japanese designs upon some of our most modern fictile goods, but expensive tea trays of *papier mache*, and some costly coal boxes made of japanned iron, are all ornamented upon Europeanized Japanese designs. Flat surfaces with a narrow border, which have for so long been thought correct taste, are now giving way to illustrations from still nature and natural history. Firms of the longest standing are now resorting for suggestions to pattern books which are half a century old. Whether it is cause for congratulation that Tyrian dyes and the hues of the rose are again appearing upon our embellished hardwares, or whether they indicate the growth of a correctly educated art taste, we do not care to say; but the evidences, taken in connection with others which wear a political hue, are decidedly noteworthy. We may even yet get back to "Abraham in red, sacrificing Isaac in blue, upon a green altar, with a black ground."

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Nickel Plated Irons.......................75 cents extra.
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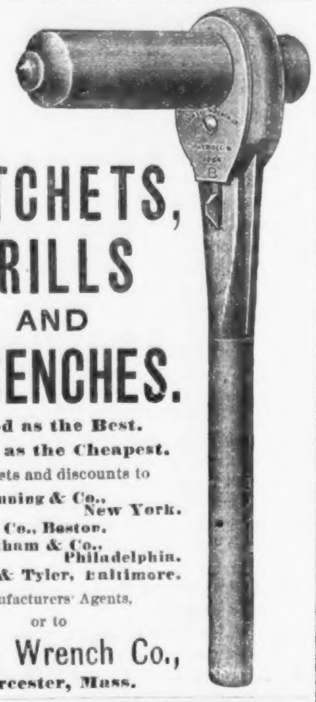

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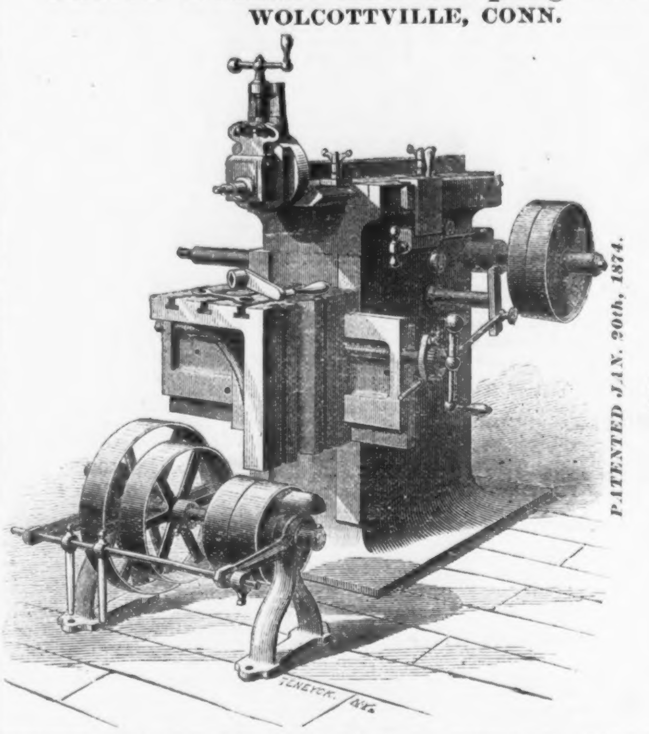

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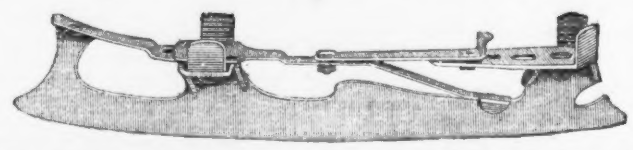

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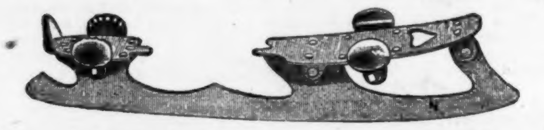

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No. 1, weight 16 lbs., cuts ⅜x2 inch, or ⅛ inch round or square.....Price $25·00
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This is by far the most powerful Iron Cutter in use which can be worked by hand, having three times the capacity of any other machine which sells at the same price. The No. 3 machine occupies a space of 12x30 inches; when in use additional space must be had for the lever to work in. We send two sets of knives with each machine—one for square and flat, the other for round iron and steel. By using the knives adapted to it, round iron is cut without being flattened. One man can cut the largest size iron named above, but two would be required for steady work. It does not take a minute to change the knives or to shift the machine from large to small sizes.

AUGUSTA, GA., March 3, 1875.

MILLERS FALLS CO.—Enclosed find draft for amount of invoice, January 7. We would have sent the amount before, but did not have an opportunity of trying the Iron Cutter until a few days ago. It is one of the best machines we ever saw.
Yours, truly, MOORE & CO.

Office of the ATHENS FOUNDRY AND MACHINE WORKS, ATHENS, GA., February 18, 1875.

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Truly, yours, R. NICKERSON, Agent.

We make a satisfactory discount to dealers, and warrant the cutters to do all which we claim for them. Send for prices.

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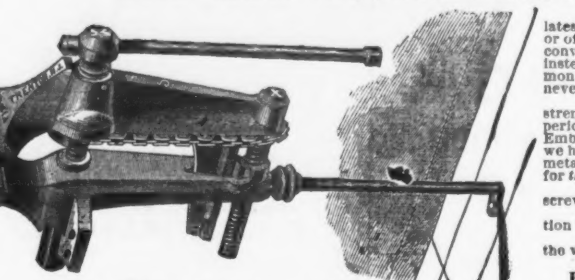

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" 3,	5¼ in. x 1⅛ in.	1¼ in.	16 in.	6½ in.	17 00
" 4,	6¼ in. x 1⅛ in.	1⅜ in.	19 in.	7½ in.	22 00
" 5,	7 in. x 1¼ in.	1½ in.	24 in.	9 in.	30 00
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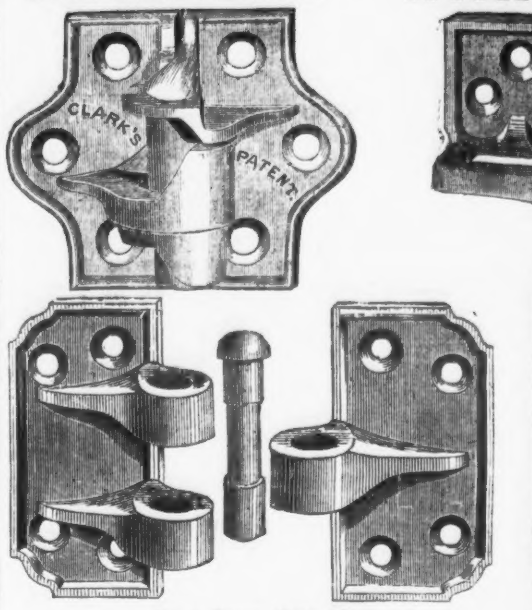

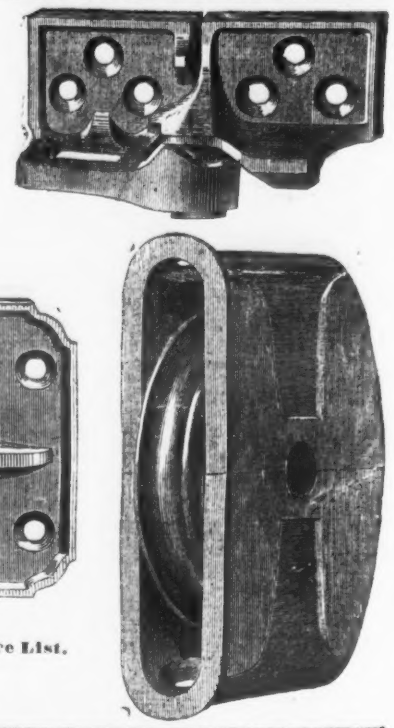

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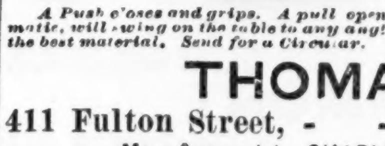

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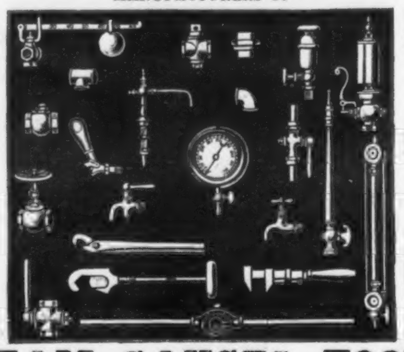

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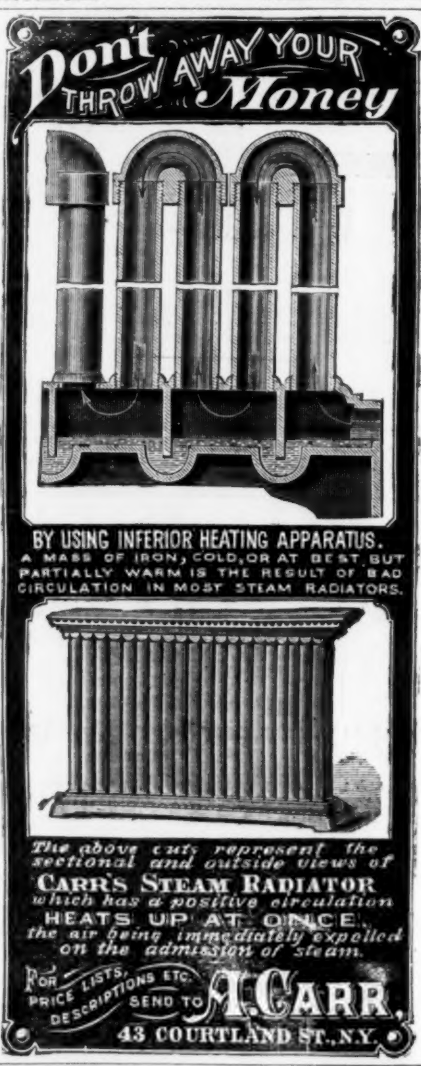

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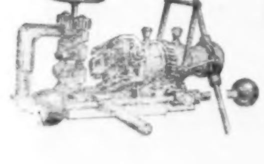

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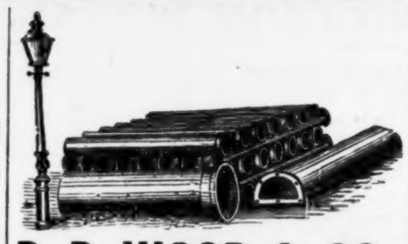

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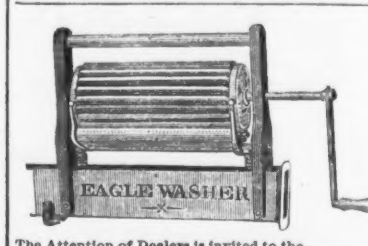

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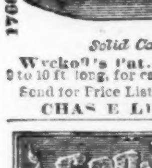

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This machine, so long and favorably known to the trade, has lately been materially improved, and is now presented as a perfect machine; working in X, XX, XXX and XXXX tin, sheet iron and copper, straight, flaring and oval work, such as wash boilers, coffee pots, &c. It is the only machine in use that double seams and sets down without changing the work. Its weight is 101 lbs. and its dies and setting down wheel are made of cast steel. The entire machine and attachments are constructed on a principle that secures its satisfactory operation. It is Warranted. No Tinner can afford to be without it. Price $36. See advertisement in *The Metal Worker*. Send for Circular and Price List to W. L. Hendley, Manufacturer, 35 William St., N. Y. City. Also, Olmsted's Double Seaming and Deflecting Machine, and Waugh's Circular and Squaring Shears.

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For steel melting holes, Siemens Gas Furnaces, Bessemer Steel Mills, Hearths and Boshes of Blast Furnaces, Flue Box Arches, &c., &c., our Benezet is unequaled. For Rolling Mills, Foundries, Linings and Hot Blasts of Furnaces, Lime Kilns, &c., our Clarion is unsurpassed.

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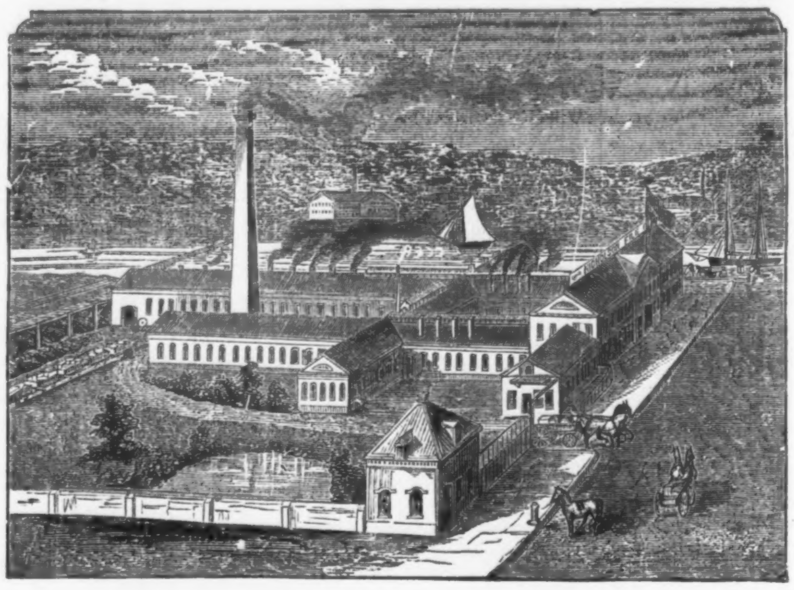

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Stove Linings a Specialty. TROY, N. Y.
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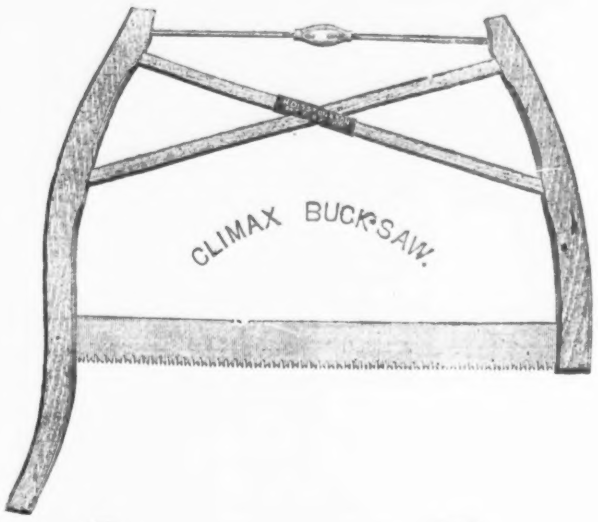
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag,*" which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"



THE LUMBERMAN

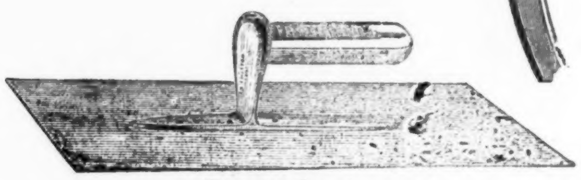
Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.

THE CLIMAX.

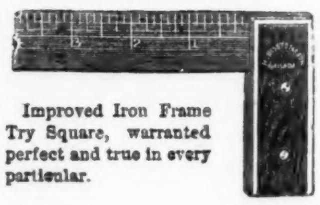
The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.

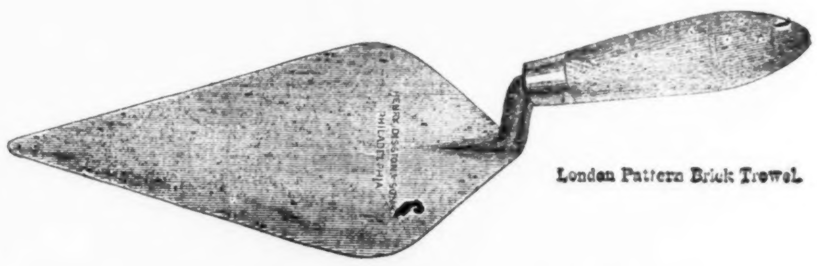


Plastering Trowel.

California Butcher Saw, Flat Steel Back, Clock Spring Blade.

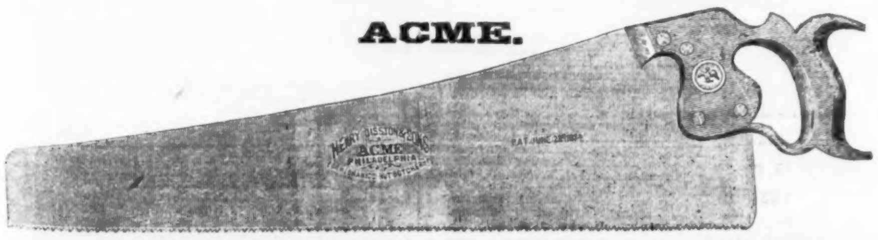


Improved Iron Frame Try Square, warranted perfect and true in every particular.



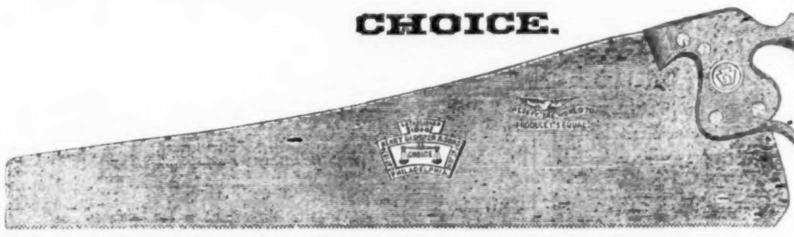
London Pattern Brick Trowel.

HENRY DISSTON & SONS'
New Patent Skew-back Hand-Saw,
ACME.



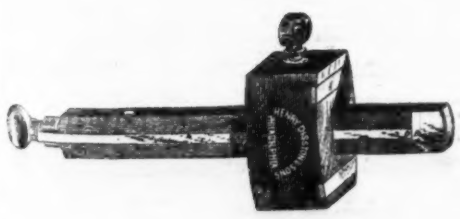
We consider these Saws to be the ACME of perfection. So say all first-class Mechanics who have used them.

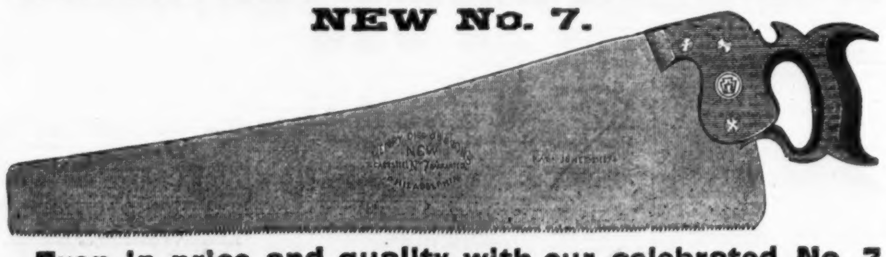
HENRY DISSTON & SONS'
New Patent Skew-back Hand-Saw,
CHOICE.



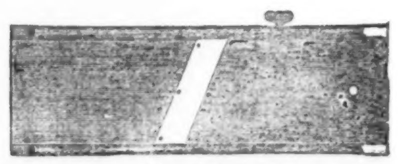
This Saw is the "CHOICE" of all first-class Mechanics who have used it.

HENRY DISSTON & SONS'
Patent Skew-back Hand-Saw
NEW No. 7.





Even in price and quality with our celebrated No. 7 Saw. Warranted to give satisfaction every time.



Saw Cutter.

New York Wholesale Prices, October 20, 1875.

HARDWARE.

Anvils.
Wright's.......... ℔ ℔ gold 11c; over 250 ℔s 11¼c, gold
Armitage's Mouse Hole..................gold 11c
Wilkinson's..................℔ ℔ gold 11c
Eagle Anvils..................℔ ℔ 8c

Apple Parers.
Domestic, Turn Table, Lightning, Hudson's, Reading, Union .... $7.75 ℔ doz
Skeleton Paring, Coring and Slicing....$5 00 ℔ doz net
Bay State, Paring, Coring and Slicing....$15 00 dis 10 %
Climax Slicer....................8 00

Ash Sifters.
J. E. Corning's Barrel Head..................dis 10 %

Augers and Bits.
Conn. Valley Mfg. Co., Douglass', Ives', Beecher (French, Swift & Co.), Griswold, Challenge .... 1st quality....dis 40&10 %
Nobles Mfg. Co..................dis 40 @ 40&10 %
Cook's..................dis 40&10 %
Diamond Hardware Co..................dis 25&10 %
Snell Mfg. Co..................dis 25 %
Jennings' Bits..................dis 10 %
Lewis' Single Twist Bits..................dis 20 %
Andrews' Bits..................dis 25 %
Griswold's Patent Bits..................dis 40 %
Expansive Bits, Clark's....small, $18; large, $26—dis 15 %
" " Ives'..................$22 @ $30—dis 20 %
" " Blake's..................$30—dis 20 %
Hollow Augers, Douglass'..................dis 40 %
" " French, Swift & Co..................
" " Bonney's Adjustable.℔ doz $48—dis 25 %
" " Stearns'..................℔ doz $48—dis 25 %
" " Ives' Expansive.......each $4 50—dis 40 %
" " Universal Expansive..each $4 50—dis 40 %
Gimlet Bits—Screw, $7 50; no screw, $9....dis 20&10 %
Double Cut Gimlet Bits, Shepardson's..................
" " Ct. Valley Mfg. Co..................dis 30&10 %
" " Hartwell's..................dis 50 %
" " Douglass'..................dis 20&10 %
" " Ives'..................
Morse's Bit Stock Drills..................dis 40 %
L'Hommedieu's Ship Augers..................dis 20 %
Watrous ship Augers..................dis 10 %
Vaughan's Post Hole—
6 in., $23 60; 7, 8 and 9 in. $25 per doz..................

Awls, Brad Sets, &c.
Awls, Sewing, Common........per gross $1 20—dis 15 %
" " Best..................per gross $1 00—net
" Shouldered Peg..................per gross
" Patent Peg..................per gross
" Shouldered Brad..................per gross
Brad Sets, Aiken's........per doz $14 40—dis 25&10 %
" No. 42, $10 50; No. 43, $12 50 ....dis 20 %
" Clark's..................dis 40&10 %
" Stanley's Excelsior........$13 50—dis 25&10 %

Axes.
Brook's..................per doz $12 00 @ 14 00 net
Blood's..................per doz $15 00 @ 16 50—dis 10 %
Hunt's..................per doz $12 50 @ 14 00
Collins'..................℔ doz 11 00 @ 15 00 net
R. Clark's (J. C. W. & Co.) bron'd or red ℔ doz $10 00 net
Bard's..................℔ doz 12 00 @ 11 50
Simmons'..................℔ doz 12 00 @ 13 50
Morris'..................℔ doz 12 00 @ 13 50
Red Jacket..................℔ doz 12 00 @ 13 50
Mann's..................℔ doz 12 00 @ 13 50
" Double Bitted..................℔ doz 21 00 @ 22 00
Underhill's..................℔ doz 12 00 @ 13 50
" Crown..................℔ doz 12 50 @ 13 50
John Leverett's..................℔ doz 12 50 @ 13 50
Ten Eyck..................℔ doz $10 50 @ 12 50 net
M. H. Jones & Co..................℔ doz $10 50 @ 12 50 net
Nobles Mfg. Co..................per doz $10 50, net
Ele. hant..................per doz $10 50 @ 11 00 net

Axle Grease.—Fraser's..................

Balances.
Spring, Plated..................new list dis 50&5 %
Iron (Dial)..................new list dis 50&5 %
Brass (Plated list)..................new list dis 50&10 %
Eroide..................dis 25&10 %

Bells.
Hand, Light Brass..................dis 70&10 %
" " Extra Heavy..................dis 40&10 %
" White Metal..................dis 50&10 %
" Silver Chime..................dis 50&10 %
" Swiss..................dis 25 %
" Globe (Cone's Patent)..................dis 40 %
Gong, Abbe's..................dis 25&10 %
" Yankee..................dis 35&10 %
" Barton's..................dis 25 %
Clock, Taylor's..................dis 25 %
" Brooks..................dis 25 %
" Cone's..................dis 25 %
" Connel's..................dis 10 %
Lever, Sargent's..................dis 25 %
" Taylor's..................dis 25 %
" Hart, Bliven & Mead Mfg. Co..................dis 25 %
Pull..................dis 25 %
" Brook's..................dis 25 %
" Western..................dis 21 %
Call..................dis 25 %
Cow—Common Wrought..................dis 40&10 %
" Western..................dis 25&10 %
" Sargent's..................dis 25&10 %
" Kentucky "Star"..................dis 40 %
" " Sargent's..................dis 40 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 2 3 4 5 6 Hog.
$12 00 10 00 9 00 8 00 6 00 5 00 3 50 2 50 3 00—dis 45 %
" Yaw's Genuine..................dis 40 %
" Texas..................dis 35 @ 40 %

Bellows.
Blacksmiths', Common, List of Sept. 15..................dis 15 %
" Extra and Pittsburgh Pattern....new list dis 15 %
Moulders'..................dis 30 %
Hand Bellows..................dis 50 %

Blind Adjusters.—Domestic....℔ doz $4—dis 20 %

Blind Fasteners.
Mackrell's..................dis 10 %
Van Sand's, No. 3000, $14 00; No. 3005, $15 50 net dis 10 %
Washburn's Patent..................℔ gross $14 00 dis 10 %
Merriman's..................new list net

Blind Staples.
Boardman's Patent, ⅜ in. and larger..................℔ ℔ 8c
" " ¼ in..................42 c

Blocks.
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list..................dis 30 %
Burr's..................dis 30 %
Stanley Rule and Level Co..................dis 10 %

Bolts.
Cast Iron Barrel, Shutter, &c..................dis 60&10 %
Cast Iron Chain..................dis 60&10 %
Wrought Iron Barrel..................dis 50, 10&10 %
" " Square..................dis 50, 10&10 %
" " Shutter..................dis 50, 10&10 %
Wrought Iron Flush, Stanley's..................dis 15&10 %
" " Sargent's..................dis 15&10 %
Carriage and Tire, Common..................dis 75 %
" " Norway Iron..................dis 50 @ 10 %
" " R. B. & W..................(old list) dis 60 %
" " Philadelphia..................dis 25 %
" " Shelton's..................(dis list) dis 40 %
Union Nut Company, old list..................dis 40 %
Stove..................dis 25 %
" R. B. & W..................dis 40 %
" Shelton's Sheaved Head..................dis 40 %

Borax...................℔ ℔ ...

Boring Machines.
Upright. Angular.
Hover's, no Augers..................$3 75 $4 00 net
" with Augers..................5 75 6 00 net
Douglass', no Augers..................3 60 4 00 net
" with Augers..................5 60 6 00 net
Parr's, no Augers..................7 50 10 00 dis 30 %
" with Augers..................
Kellogg's, no Augers..................5 25 6 25 dis 10 %
" with Augers..................
Snell's..................4 75 6 25 dis 10 %
Phillips', with Augers..................6 25 dis 10 %
Mortising Machines, $30 00 each..................

Bow Pins.
Union Nut Co..................new list dis 50&10&5 %
Hotchkiss'..................dis 50&10 %
Humason, Beckley & Co.'s..................dis 50&10 %
Sargent & Co.'s..................dis 50&10&10 %

Braces.
Barber's Patent..................dis 40 %
Q. S. Backus..................dis 25 %
Wilson Mfg. Co..................dis 25 %
Spofford's Patent..................dis 25 %
Noble's Patent..................dis 40 %
Ives' Novelty..................dis 40 %
" Hamden..................dis 25 %
Common Ball (American)..................dis 30 %

Brackets.—Shelf..................dis 60&10 @ 60&10&5 %

Bright Wire Goods...................dis 60&10 %

Butt Rings.—Union Nut Co..................new list dis 50&10&5 %
Sergeant's..................
Hotchkiss'..................dis 50&10 %

Bung Hole Borers.
Common and Hing..................dis 10 %
Ives' Tie Borers..................dis 20 %
Enterprise Mfg. Co..................dis 25 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co..................dis 25 %
Bradley's..................dis 10 %
Beatty's..................dis 10 %
1 2 3 4 5 6 7 8
$19 50 $21 50 $24 00 $27 00 $30 00 $33 75 $36 50 $40 00
Hart Mfg. Co.—1 2 3 4 5
$26 25 $29 75 $34 25 $38 75 $43 25 $47 50 $54 00

Butts.
Wrought Brass..................dis 50 %
Cast Brass..................dis 25&10 %
Common Cast, not Drilled..................dis 70 %
Fast Joint, Narrow..................New list July 1, dis 30&10 %
" Broad..................dis 30&10 %
" Jap'd..................dis 30&10 %
Loose Joint, Narrow and Broad..................dis 30&10 %
" Jap'd..................dis 30&10 %
Parliament Butts & Mayer's Hinges..................dis 50&10 %
Loose Pin..................dis 30&10 %
" Japanned..................dis 30&10 %
Loose Pin, Jap'd, Plated Tips..................dis 30&10 %
Drilled and Wired.
Fast Joint, Narrow..................New list July 1, dis 25&10 %
" Broad..................dis 25&10 %
" Japanned..................dis 25&10 %
Loose Joint..................dis 25&10 %
" Japanned..................dis 25&10 %

Parliament and Mayer's Hinges.................." dis 35&10 %
Loose Pin.................." dis 40&10 %
" Japanned.................." dis 50&10 %
" Plated Tips.................." dis 25 %
Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint..................dis 55&10 %
Nickel Plated..................dis 33⅓&10 %
Boston Finish, Plain..................dis 25 %
" with Iron Acorns..................dis 75&5 %
" with Silver..................dis 65&5 %
Wrought Iron.
Fast Joint, Narrow, Lt. and Regular..................dis 30 %
" Broad..................dis 25 %
Loose Joint, Narrow and Broad..................dis 35 %
Table Butts, Back Flaps, &c..................dis 40 %
Inside Blind, Regular..................dis 40 %
" Light..................dis 40 %
Loose Pin, Wrt..................dis 40 %
Am. Spiral Spring Butt Co.'s list May 1st..................dis 25 %
Union Spring..................dis 40 %
Blind Butts, Parker..................dis 60 %
" Palmer..................dis 60&10 %
" Seymour..................dis 60&10 %
" Shepard..................dis 60 @ 60&10 %
" Lull & Porter..................dis 60&10 %
" Nicholson..................dis 60&10 %
" Huffer..................dis 33⅓&10 %
" Garretson, No. 1..................dis 33⅓ %
" Clark's, Nos. 1, 3 and 5..................dis 60 %
" Clark's No. 3..................dis 60 %
" Nos. 2, 4, 4½, 6, 8, 10..................dis 60 %

Caps—Percussion, per 1000.
G. D..................37 @ 40c
Ely's E. B..................1-4s, 59c; 1-10s, 80c gold
" Double Waterproof, 1-4s, $1 45; 1-10s, $1 52¼c. gold
" Ely's..................1-10s 80c gold

Carpet Sweepers.
Union..................each $2 75 net
Welcome..................each 2 75 net

Cartridges.—Metallic..................dis 25 %

Curas.—Horse and Curry..................dis 40&10 %
Cotton..................dis 10&10 %
Wool..................dis 15&10 %

Carpet Stretchers.
Cast Steel, Polished..................per doz $3 00 dis 30 %
Cast Iron, Steel Points..................per doz $2 00 dis 45&5 %

Casters.
Bed..................dis 30&10 @ 30&10 %
Plate and Shallow Socket..................dis 30&10 %
Deep Socket..................dis 30&10 %
Philadelphia..................new list dis 35&10 %

Cattle Leaders...................

Chain.
English Coil..................net gold
℔ ℔ 11½ 8¾ 7¼ 7¼ 7¼ 7c
5-16 ⅜ 7-16 ½ 5-8 ...
Trace, 6½-10-2..................by the cask, ℔ pair, gold 50c
Trace, 7-10-2..................by the cask, ℔ pair, gold 60c
German Halter Chain..................dis 45 %
German Coil..................dis 35 % gold
Galvanized Pump Chain..................dis 20 %
Jack Chain, Iron..................dis 50&10 %
" Brass..................dis 40&10 %

Chalk.
White..................℔ gross, 37c net
Red..................℔ gross, 50c net
Blue..................℔ gross, $1 00 net
White Crayons..................℔ gross, 16¼c net

Chisels.
Socket Framing, Douglass, Extra..................dis 60&10&10 %
" " Crossman..................dis 50&15&10 %
" " Buck Bros. equivalent to dis 50&17½ %
" " Hart Mfg. Co..................dis 50 %
" " Merrill..................dis 60 %
" Firmers, Douglass, Extra..................dis 60&10&10 %
" " Crossman..................dis 50&15&10 %
" " Buck Bros..................equivalent to dis 50&15 %
" " Hart Mfg. Co..................dis 50 %
" " Merrill..................dis 60 %
Socket Corner..................dis 25 %
Tanged Firmers..................
" Butcher's..................$5 50 to £ gold
" Newbould's..................$5 50 to £ gold
" Spear & Jackson's..................$5 50 to £ gold
" Buck Bros (Shank)..................$5 50 to £ gold

Clamps.
Cabinet..................dis 60&10 %
Gray's..................dis 25 %
Lambert's..................dis 25 %
Providence Tool Co..................dis 10 %

Clips, Axle.
Norway or Best..................dis 40 %
Superior..................dis 25 %
"Star," Superior Philadelphia..................dis 40 %

Coal Shovels.
Wrought Iron..................Nos. 1 2 dis 25 %
Long Wrt. H dles..per gross $15 00 18 00 dis 25 %
Short "..................12 00 14 00 dis 25 %
Wood Handles..................12 00 14 00 dis 25 %
Gem (Edgar's Pat.)..................15 00 18 00 dis 25&10 %
Fancy, Iron Handle..................per doz, 75 @ 80c. net
" Wood Handle..................per doz, $1 00 net

Coal Hods.
Inch. 14 15 16 17 18
Regular, Jap'd..per doz $12 00 12 75 13 50 15 50 18 00 dis 60&10 %
Regular, Galv'd..................
Ladies' Favorite, Jap'd ℔ doz 15 00 16 00 17 50 19 50 22 50 dis 60&10 %
Ladies' Favorite, Galvanized..................19 00 20 00 22 00 25 00 dis 50 %
Funnel Hods.—Nos. 15 16 17
Oriental, Japanned ℔ doz $16 50 18 00 20 00 dis 40 %
" Galvanized..................21 00 22 50 24 00 dis 40 %
Morning Glory, Jap'd..................18 00 20 00 22 00 dis 25 %
" Galv'd..................21 00 22 50 24 00 dis 25 %
Iron Clad, Jap'd..................21 00 dis 25 %
" Galv'd..................22 50 dis 25 %
Sidney Shepard & Co.'s new list..................dis 60&10 %

Cockeyes.—1¼ in., 28c.; 1½ in., 33c.; 1¾ in., 37c. net

Cocks.
Brass Racking..................dis 30&10 %
Lock and Globe..................dis 30&10 %
Lever Bibbs..................dis 30&10 %
Ale and Beer..................dis 30&10 %

Coffee Mills.
Board and Box..................dis 15 @ 20 %
Brighton..................dis 20&10 %
Increase Wilson's..................dis 25&10 %
Selsor's Pat..................$9 50, $10 50—dis 25 %
American (Enterprise Mfg. Co.)..................dis 25 %
French Steel..................dis 25 %
The Swift..................dis 20 %

Compasses and Dividers.
Bemis & Call Co.'s..................dis 55&10 %
Cook's..................dis 35&10 %
Excelsior..................dis 20 %
Peck Stow & Wilcox..................dis 40 %
Miller's Patent..................dis 40 %

Coopers' Tools.
Bradley's..................dis 15 @ 20 %
Chas. E. Little..................dis 15 @ 20 %
Swan & Brombacher..................dis 15 @ 20 %

Corkscrews...................dis 20 %

Corn Knives and Cutters...................dis 30 %

Crow Bars.
Cast Steel..................℔ ℔ 11c. net
Iron, steel points..................℔ ℔ 5½c

Crucibles.—Gautier & Co..................No. 5¼c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1 80, $2 00, $2 40..................dis 10 %
Curling Tongs..................℔ doz $2 00—dis 10 %
Pinching Irons..................℔ doz 7 50—dis 10 %

Curry Combs.
Hotchkiss' & Kellogg's, Iron & Brass, old list..................dis 45 %
Fitch's (List of No. 240, $1)..................dis 20&10 %
Rubber..................℔ doz, $9 00—dis 10 %
Wood Tooth (Fuller Bros.)..................℔ doz, $2 25 net

Curtain Pins.—Silvered Glass..........New list dis 10 %

Cutlery.
American Table } Meriden } New list Jan. '75, dis 25 %
American Pocket } Cutlery Co. } dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co..................dis 25 %
Am. Miller Bros.'s Cutlery Co..................dis 25 %
Sargent's..................dis 25 %
Naugatuck Cutlery Co..................dis 25 %

Dippers.
Britannia..................per doz 7 50—dis 30 %; by bbl. dis 33⅓ %
Cocoa, Plain..................per doz $2 00—dis 25 %
" Rimmed..................per doz 3 75—dis 25 %

Dog Collars.
Embossed Gilt..................dis 50 %
Common..................dis 20 %
Brass..................dis 20 %

Door Springs.
Gem (V. W. & W.)......No. 1 Large, Jap'd ℔ doz $3 50
" " No. 2 Medium.........℔ doz 3 00 } dis 10 %
" " No. 3 Small..........℔ doz 2 00
Gray's (V. W. & W.)..................℔ doz 2 50 net
Torrey's Patent (V. W. & W.)..................℔ doz 2 50 net
Philadelphia..................℔ doz 7 50 net
" ....1 in., $3 00; 1½ in., $7 00 dis 10 %
Palmer's Japanned No. 6..................℔ doz 2 00 net
" Coppered..................℔ doz 2 50 net
" Silvered..................℔ doz 3 00 net
Challenge—Japanned..................No. 3, per doz $2 00
" " No. 1, " 2 50 } dis 10 %
" " No. 6, " 3 00
Barker's Concealed..................dis 12½ %

Drawing Knives.
Crossman's No. 1..................dis 30&10 %
Douglass, Extra..................dis 30&10 %
Hart Mfg. Co., No. 1..................dis 50 %
Merrill..................dis 50 %
Nobles Mfg. Co..................dis 20 %
Adjustable..................dis 30 %
Adjustable Handle..................dis 20 %

Drills and Drill Stocks.
Blacksmiths'..................each $5 50 net
" Self-Feeding..................each $5 00 net
Breast, P. S. & W..................dis 40&10 %
" Aiken's..................dis 25&10 %
" Hotchkiss..................dis 30 %
" Wilson's..................dis 10 %
" Miller's Falls..................dis 10 %
Hatchet, Merrill's..................dis 25 %
" Ingersoll's..................dis 25 %
" Whitney's..................dis 25 %
" Weston's..................dis 25 %
" Moore's Triple Action..................dis 25 %
Wilson's Drill Stocks..................dis 30&10 %
Automatic Boring Tools..................dis 20 %

Drill Chucks.—The Danbury..each $10 50—dis 10 %
Beach Patent (Morse)..................dis 10 %

Egg Beaters.
Monroe's..................8 in. 10 in.
" Per doz $4 00 4 50—dis 10 %
Dover..................per doz $1 60—dis 10 %
National..................per doz $1 00 net
Peerless..................per doz $1 00—net

Emery.
Genuine Chester—Regular Nos.........℔ ℔ 6c } dis 10 %
" Flour and FF..................℔ ℔ 5c

Washington Mills—Regular Nos..................℔ ℔ 8c
" Flour..................℔ ℔ 5c

Enameled and Tinned Ware.
Kettles..................dis 30 @ 40 %
Sauce Pans..................dis 25 %
Glue Kettles..................dis 25 %
Tinned Saucepans..................dis 25 %

Escutcheons.
Door Lock..................Same discounts as Door Locks
Brass Thread..................dis 60&10 %
Wood..................dis 25 %

Faucets.
Fenn's..................dis 50 %
" Cork Stops..................dis 40 %
Star..................dis 55&10 %
Frary's Patent Petroleum..................dis 15&10 %
Taylor's Pattern..................dis 20&10 %
Wood and Metallic..................dis 40 %
Wood, Cork Lined..................dis 65 @ 65&5 %
Enterprise Mfg. Co., Self-Measuring..................dis 20 %
Felloe Plates...................℔ ℔ 15c; dis 25&10 %

Files.
American File Co..................$5 00 to £ currency—dis 20 %
Arcade File Works..................$5 00 to £ currency
Auburn File Works..................$5 00 to £ currency—dis 10 %
Nicholson..................new list, Jan. 1, 1875, net @ dis 5 %
Hartford File Co..................$5 00 to £ currency—dis 10 %
L. B. Heller & Bros..................$5 00 to £ currency
Heller & Bros..................$5 00 to £ currency
"Western"..................$5 00 to £ net
Wheeler, Clemson & Co..................$5 00 to £ currency
Rothery's..................$5 00 to £ gold
J. & Riley Carr..................$5 00 to £ gold
" Horse Rasps..................
Stubs'..................$5 50 @ $ 50 to £ gold
Butcher's..................$5 00 to £ gold
Walter Spencer & Co.'s "Diamond"..................$5 00 to £ gold
Spear & Jackson's..................$5 00 to £ gold
Jowitt's..................$5 25 to £ gold
Newbould's..................$5 00 to £ gold
W. K. & C. Peace's "Imperial"..................$5 00 to £ gold
R. Ibbotson..................$5 00 to £ gold
Turton Bros. & Matthews..................$5 50 to £ currency
Fisher's..................$4 75 to £ gold
Goodlad's..................$4 50 to £ gold
Moss & Gamble..................$5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) $5 00 to £ gold
" Horse Rasps..................$5 00 to £ gold
"Philo Sheffield," P. T. Co..................$5 00 to £ gold
Limet & Co. (French)..................$5 00 to £ gold

Fluting Machines.
Mrs. Coles' Pony..4 in., $4 75; 5 in., $5; 6 in., $5 50; 7 in., $6
Knox, with 4-inch Rolls..................4 50 each net
" " 6 "..................5 00 each net
" " 8 "..................6 25 each net
O. K..................4 00 each net
Peerless, 4-inch Rolls..................4 00 each net
" 6 "..................5 00 each net
Excelsior, No. 1..................4 75 each net
" No. 2..................5 00 each net
" ....7 50 each net
Diamond..................4 00 each net
Champion, 6 inch rolls..................6 00 each net
" 4-inch rolls..................5 00 each net
Climax 7-inch Rolls..................8 00 each net
" 4½..................6 00 each net
Empire..................4 00 each net
Eureka, No. 1, 7-inch Roll..................8 00 each net
" No. 2, 5-inch Roll..................6 00 each net
Defiance......4 in., $3 50; 6 in., $4 00; 8 in., $6 50 each net
K. F. M., 4½-inch Roll..................5 50 each net
" " 6 "..................6 00 each net
Myers Fashion Fluter, 4½-inch Rolls..................2 75 each net
" Convex Brass Fluter, Sad Iron at-tachment..................per doz $15 00
Domestic Fluter..................2 50 each net
Geneva Hand Fluter..................$15 00 per doz net

Fluting Scissors...................dis 25&10 %

Forges.
"Empire" (W. P. Kellogg & Co.)..................dis 20 %

Forks.
Hay, Manure & Spading..................dis 33⅓ %
Plated A. I..................dis 25 %

Fry Pans.
Burnished, P. S. & W., new list..................dis 50 %
Nos. 0 1 2 3 4 5 6 7 8
℔ doz..$3 00 4 00 4 25 4 75 5 25 6 00 7 00 8 00 9 00
Smith, Burns & Co., "Excelsior" Polished..................dis 20 %
Nos. $3 70 4 00 4 70 5 20 6 00 7 00 8 00 9 00
No. 1 2 3 4 5 6 7 8

Gas Stoves.
Tifft & Howard..................dis 20 %

Gauges.
Marking..................dis 45&10 %
Wire..................dis 10 @ 30 %
" Smith's Patent..................per doz $18 00, dis 40 %

Gimlets.
Nail and Spike..................dis 25&10 %
Double Cut, Shepardson's..................dis 30&10 %
" " Hartwell's..................dis 50 %
" " Ives'..................
" " Douglass'..................dis 20&10 %

Glue Pots.
Tinned and Enameled..................dis 25 %
Family, Howe's "Eureka"..................dis 20 %
" L. E. & C.'s "Handy"..................dis 25 %

Grind Stone Fixtures
Sargent's Patent..................dis 65&10 %
Reading Hardware Co..................dis 40 %
J. F. Green & Bro..................dis 40 %
Hart Mfg. Co.'s..................dis 60&5&10 %
Rick Bros..................dis 45&5 %

Hammers.
Emmet Hammer Co.'s Handled..................dis 25 %
" Sledge & Stone.℔ ℔ 40c.; dis 40 %
Humason & Beckley Mfg. Co..................dis 16⅔&10 %
Maydole's..................dis 12 %
Cheney's..................net @ dis 5 %
Verree..................dis 5 %
Yerks & Plumb..................dis 20 %
Magnetic Tack..................dis 25&10 %
Warner & Noble's..................dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair.................. } dis 25 %
" Leg Irons $6 50 per pair..................
Providence Tool Co.'s Hand Cuffs $15 per doz } dis 10 %
" " Leg Irons 25 "

Handles.
Door or Thumb Latches—
Nos. 0 1 2 3 4
Per doz $1 80 1 00 1 18 1 35 1 50—dis 60 %
Roggin's Latches..................40c. @ 50c. net
Bronzed Iron Drop Latches..................per doz $1 30 net
Wrought Chest..................dis 60&10 %
Surface Chest..................dis 65&10&10 %
Flush Chest..................dis 60&10&10 %
Lifting..................dis 60&10 %
Coffin..................dis 50&10 @ 60&10 %
Saw and Plane..................dis 25&10 %
Hammer and Hatchet..................dis 10 %
N. Carolina Handle Co..................dis 15 %
Brad Awl..................per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 20&10 %
" " " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " " large " 7 50—dis 20&10 %
Socket " " ass'td " 3 50—dis 20&10 %
" Framing " " 7 00—dis 20&10 %
File.................. " " 4 00—dis 20&10 %
Auger.................. " " 6 50—dis 20&10 %
" " large " 8 00—dis 20&10 %
Patent Auger, Ives'..................dis 25&10 %
" " Douglass'..................per set $1 25—dis 10 %
" " Swan's..................per set $1 00—dis 20&10 %

Hangers.
Barn Door..................dis 65&10 %
"Anti-Friction" No. 1, $1 25; No. 2, $1 50 per pair dis 40 %
Novelty..................dis 30 %
Challenge..................dis 40 %

Harness Snaps.
Henshaw's..................dis 25&10 %
Judd's..................dis 40 %
Fitch's (Bristol)..................dis 30 %
Hotchkiss'..................dis 10 %
Andrews'..................dis 25 %
Sargent's..................dis 50&10 %
New York Wire..................dis 20&20 %

Hatchets.—Isaiah Blood..................dis 15 %
Shingling, Nos. 1 2 3..........℔ doz $7 25 8 00 8 75
Claw, " 1 2 3..........℔ doz 7 75 8 50 9 25
Lathing, " 1 2 3..........℔ doz 7 50 8 00 8 50
Hunt's..................dis 10 %
Shingling, Nos. 1 2 3..........℔ doz $7 25 8 00 8 75
Claw, " 1 2 3..........℔ doz 7 75 8 50 9 25
Lathing, " 1 2 3..........℔ doz 7 50 8 25 9 00
Hurd's..................dis 25 %
Shingling, Nos. 1 2 3..........℔ doz $8 00 8 50 9 00
Claw, " 1 2 3..........℔ doz 9 00 9 50 10 00
Lathing, " 1 2 3..........℔ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s..................dis 25 %
Shingling, Nos. 1 2 3..........℔ doz $6 50 7 00 7 50
Claw, " 1 2 3..........℔ doz 7 25 7 75 8 25
Lathing, " 1 2 3..........℔ doz 6 50 7 00 7 50
Yerkes & Plumb..................dis 20 %
Shingling, Nos. 1 2 3..........℔ doz $7 00 7 50 8 00
Claw, " 1 2 3..........℔ doz 7 50 8 00 8 50
Lathing, " 1 2 3..........℔ doz 7 00 7 50 8 00
Simmon's..................dis 15 %
Shingling, Nos. 0 1 2 3....℔ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3....℔ doz 9 00 9 50 10 00
Lathing, " 1 2 3....℔ doz 8 00 8 50 9 00
Broad, " 1 2 3....℔ doz 9 00 10 00 12 00
" " 4 5 6....℔ doz 14 00 16 00 18 00
" " 7 8....℔ doz 20 00 22 00
Elephant..................dis 30 %
Shingling, Nos. 1 2 3..........℔ doz $8 00 8 50 9 00
Claw, " 1 2 3..........℔ doz 9 00 9 50 10 00
Lathing, " 1 2 3..........℔ doz 8 00 8 50 9 00
J. P. Verree & Co..................dis 5 %
Shingling, Nos. 1 2 3..........℔ doz $7 00 7 50 8 00
Claw, " 1 2 3..........℔ doz 7 50 8 00 8 50
Lathing, " 1 2 3..........℔ doz 7 00 7 50 8 00
Underhill's..................dis 10 %
Shingling, Nos. 1 2 3..........℔ doz 7 25 8 00 8 75
Claw, " 1 2 3..........℔ doz 7 75 8 50 9 25
Lathing, " 1 2 3..........℔ doz 12 00 11 00 13 00
M. H. Jones & Co..................dis 25 %
Shingling, Nos. 1 2 3..........℔ doz $8 00 8 50 9 00
Claw, " 1 2 3..........℔ doz 9 00 9 50 10 00
Lathing, " 1 2 3..........℔ doz 8 00 8 50 9 00

Hay Knives.—"Lightning"......per doz $20 00 net

Hinges.
Gate, Western..........℔ doz $6 25—dis 60&10 %
" N. E..........℔ doz 11 25—dis 60&10&10 %
" N. Y. State..........℔ doz 7 20—dis 60&10 %
Rolled Plate..................dis 65&10 %
" Raised..................dis 65&10 %
Wrought Strap and T..................dis 33⅓&10&5 %
Providence Plate. { 6 and 8 in. 11c ℔ ℔ / over 8 in. 9¼c ℔ ℔ } ...... dis 30 %
Screw Hook and Strap.......... { 8, 10, 12 in. 6¼c / 14 to 36 in. 5¾c } ....net
Heavy Welded Hook.......... { 8 to 12 in.. 6¼c / 14 in. & up, 6c } ....net

Screw Hook and Eye.......... { ⅝ to 1 in., 8¼c / ⅜ in. 9¼c / ¼ in. 11¼c } ....net

Hoes.
Solid Shank, C. S..................℔ doz $8 00—dis 35 %
Socket..................℔ doz 9 00—dis 35 %
Riveted Eye..................℔ doz 5 00—dis 35 %
Grub..................dis 25 %
Planters..................net @ dis 5 %
" Scovill..................add 33⅓ %
" Scovill Pattern..................net @ dis 5 %
Lane's C. S. Cresent, American Pattern..................list net
" " Scovil Pattern..................add 10 %

Hooks.
Bird Cage..................dis 60&10 @ 70&10 %
Cotton..................dis 50 %
Belt..................dis 55 @ 60 %
Bench—Hotchkiss' $5 00 ℔ doz..................dis 10 %
" Weston's No. 1, $8 00; No. 2, $7 00 per doz net
" McGill's..................$3 00 per doz, dis 10 %
" Skinner's..................per doz $6 25, dis 20 %
Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling. } Hart's list..................dis 60&10&10 % / Sargent's list..................dis 60&5&10 % / Reading list..................dis 35&10 %
Wrought Staples and Hooks and Staples......dis 70&10 %
Wire Screw Hooks and Eyes..................dis 65&10&10 %
Grass..................dis 25 %
Whiffletree—Patent..................dis 35 %
Hooks and Eyes—Malleable Iron..................dis 60&10&10 %
" " Brass..................dis 60&10&10 %

Horse Nails.
	Nos.	5	6	7	8	9	10
American Pressed	℔ ℔	22c	20c	20c	20c	20c	20c
Ausable	"	30c	27c	25c	24c	23c	22c
" P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
" & Blued	"	32c	29c	27c	26c	25c	24c
Cortland	"	29c	26c	24c	23c	22c	21c
Buffalo Forged	"	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin	"	28c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin	"	30c	27c	25c	24c	23c	22c
Perkins' Pointed and Polished	"	30c	27c	25c	24c	23c	21c
Perkins' Pointed and Blued	"	31c	28c	26c	25c	24c	22c
Putnam	"	32c	28c	26c	25c	24c	23c
Vulcan, P't'd & Blued	"	33c	30c	28c	27c	26c	25c

Star Brand, 16c.; Morgan..................14c
Putnam..................2000 lbs., dis 5 %
Ausable, Am. Pressed, Perkins, Globe, National and New London..................1000 lbs., dis 5 %
Vulcan..................1000 lbs., dis 7½ %
Vulcan and Brundage..................500 lbs., dis 5 %

Horse Shoes.
Burden..................℔ keg, $5 12½
R. I. Horse Shoe Co., Perkins Pattern......℔ keg, 5 12½
" " R. I. Pattern......℔ keg, 5 87½
Mule Shoes..................℔ keg, 6 12½
Perkins' Snow..................℔ keg, 6 62½
Boston Rolling Mills Hand Made..................℔ ℔ 8c

Kettles.
Brass..................℔ ℔ 45c net
Enameled..................dis 30 @ 40 %

Knives.
Ames' Butcher Knives..................dis 20 %
" Shoe "..................dis 15 %
" Bread "..................℔ doz $1 50—dis 15 %
Hay and Straw, "Wadsworth's"..................dis 20 %
Table and Pocket..................See Cutlery

Knobs.
Carriage (Jap'd 8) cents per gross)..................dis 60&10 %
Base—Common..................net
" Plush Tip..................dis 10 %
" Elastic End, No. 8..................dis 40&10 %
Door, Mineral..........℔ doz $2 25
" Por. Jap'd..........℔ doz 3 00 } ....dis 40&5 %
" " Plated..........℔ doz 7 00 } & 2 % for cash
" " Por..........℔ doz 7 50
Furniture, Plain..................75c gross inch, dis 10 %

Ladles.
Melting, Hart's..................dis 55&10 %
" Sargent's..................dis 50&10 %
" Reading..................dis 15&10 %
" Monroe's Patent..................per doz $4 00 dis 20 %

Lanterns.
Tubular..................No. 0, $11 00; No. 1, $14 00 net
Peerless..................No. 5, per doz $11 75—dis 10&10 %
Brady's Patent..................dis 10 & 10 %
Ætna..................dis 10 & 10 %
Yankee..................dis 10 & 10 %
De Beque..................dis 10 & 10 %

Lard Presses.
Draw Cut, 14 inch..................each $65 00—dis 20 %

Lemon Squeezers.
Porcelain Lined..................per doz $7 00, dis 15 %
Eureka, Tinned..................per doz, $3 00 dis 10 %
Dunlap's Improved..................per doz $6 00 net

Lines.
Linen Fish..................dis 20 %
Cotton Chalk..................dis 40 @ 45 %
Sil. Lake Chalk......Nos. 0, 1, 2, 3, $6, 6 50, 7, 7 50, dis 20 %
Mason's..................dis 20 %

Locks and Latches.
Cabinet—Gaylord..................dis 25 %
" Eagle..................dis 25 %
Trunk..................dis 25 %
Langstroth & Crane, Round Key..................dis 40 %
" " Flat Key..................dis 33⅓ %
Barnes & Deitz, Flat Key..................dis 25 %
Yale Lock Co., Flat Key..................dis 40 %
Sargent & Greenleaf, Flat Key..................dis 20 %
Continental..................dis 20 %
Shepardson's..................dis 20 %
American Lock Co..................dis 33⅓ %
Plate..................new list dis 40&2 %
Trenton, Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co., P. & F. Corbin, Parker & Whipple, Jacobus & Nimick Mfg. Co. } ......dis 40&5 % ....and 2 % for cash
Padlocks, Russell & Erwin..........
" Mallory, Wheeler & Co... } ......dis 40&5 %
" Wm. Wilcox & Co........ } ...and 2 % for cash
" Romer's..................dis 5 %
" Vulcan Hardware Co..................dis 20 %
" New York Lock Co..................dis 20 %
" J. H. McWilliams..................dis 5 %
" Scandinavian Jail..................dis 10 @ 15 %
" Barnes & Deitz..................dis 25 %
" D. K. Miller Lock Co..................dis 30 %
" Penn Lock Works..................dis 20 %

Mallets.—Hickory and Lignumvitæ..................dis 20 %

Meat Cutters.
Dixon's (P. S. & W.)..Nos. 1 2 3 4
℔ doz. $14 00 $17 00 $19 00 $30 00 dis 25 %
Miles Challenge......Nos. 1 2 3
℔ doz. $22 00 $30 00 $40 00—dis 30 %
Perry's (P. S. & W.)....Nos. 200 300 400
℔ doz. $22 00 $27 00 $40 00—dis 25 %
Woodruff's (P. S. & W.)......Nos. 100 150
℔ doz. $15 00 $18 00—dis 25 %
Hales'..........Nos. 11 12 13
℔ doz. $27 00 $33 00 $42 00—dis 35&2 %
Draw Cut..........Nos. 5 6 7
Each $56 00 $90 00 $250 00—dis 20 %
American..................dis 25 @ 25&5 %
No...... 1 2 2½ 3 4 B 5
Each.... $6 00 $9 00 $12 00 $15 00 $30 00 $60 00 $75 00

Molasses Gates.
Stebbins'..................dis 62½&10 %
" Tinned ends..................dis 40&10 %
Bush's..................dis 20 %
Lincoln's..................dis 50&10 %
Weed's..................dis 15 %

Mortars and Pestles.
Iron..................net

Nail Pullers.
Taft's..................per doz $24 00 net

Nails...................10d., $3 10 @ $3 15 net

Nuts and Washers.
Nuts..................large, 6c; small, 8c off list.
Washers..................large, 8¼c; small, 10¼c off list.

Oilers.
Miller's Zinc, Brass and Copper..................dis 40 %
Sheet Metal Screw, Zinc, Brass and Copper....dis 40 %
Olmsted's..................dis 25&10 %
Broughton's..................dis 25&10 %
Malleable..................per doz $5 00 dis 10 %
Prior's Patent or "Paragon"..................dis 40 %

Ox Shoes.
Concave..................℔ ℔ 13c net

Ox Balls...................dis 60&10 %

Pencils
Faber's Carpenters'..................net
" Round Gilt..................℔ gross $6 00 net
Dixon's Lead..................℔ gross $4 50 net
" Lumber..................℔ gross 9 00 net

Picture Nails and Knobs.
Brass Head..................dis 60&10 %
Porcelain Head..................dis 55&10 %
Richards' Patent..................dis 40 @ 40&10 %
Judd's..................dis 60&10 %

Pinking Irons...................per doz $2 75—dis 65 %

Planes and Plane Irons.
First Quality..................dis 35 %
Second Quality..................dis 50 %
Bailey's Patent Adjustable..................dis 25&10 %
Plane Irons, Butcher's..................$5 50 to £ gold—new list
" Buck Bros..................$5 50 to £ gold
" Bailey's Patent..................dis 25&10 %
" Auburn Tool Co.'s..................dis 25 %
" Greenfield Tool Co..................net list
" Middletown Tool Co..................net list
" Ohio Tool Co..................dis 10 %
" Spear & Jackson's.... 5 50 to £ gold—new list
" Sandusky Tool Co..................dis 10 %
Plow Bits, Greenfield Tool Co..................dis 10 %

Pliers and Nippers.
Button's Patent..................dis 33⅓ %
Hull's Patent Nippers..No. 1, $15; No. 2, $21 ℔ doz dis 25 %
Leach's Patent Wire Cutters.........per doz $6 50—dis 15 %
Gas Pliers..................dis 25 %

Plumbs and Levels.
Stanley R. & L. Co.'s Pat. Adjustable..................dis 65&10 %
" " " Non-Adjustable..................dis 65&10 %
Chapin's..................dis 66⅔&10 %
Standard Rule Co.'s New Adjustable..................dis 60&10 %
Standard Rule Co.'s Non-Adjustable..........dis 60&10&10 %
Pocket Levels..................dis 50&10 %
Johnson's Patent Adjustable..................dis 60&10 %

Pulleys.
Hot House and Tackle..................dis 60&10 %
Jap'd Screw..................dis 60&10 %
Brass Screw..................dis 60&10 %
Jap'd Side..................dis 60&10 %

" Clothes Line..................dis 60&10 %
Hay Fork..................per doz $4 50 @ 5 00, dis 10 %

Pumps.
Douglas Cistern, etc..................new list dis 25 %
" S. & F..................new list dis 20 %
Union Mfg. Co.'s Cistern and Pitcher..................dis 25 %
" " Rams..................dis 20 %
" " Garden Engines..................dis 25 %
Cucumber (Burlingham & Purdy)—
6 ft. No. 3, with 12 ft. pipe..................$4 00 net
" ft. No. 1, with 12 ft. pipe..................4 50 net
From 6 to 36 ft. add 30 cents per ft.
Pipe. 8c. per ft.; Coupling, 20c. per ft.

Punches.
Belt or Drive..................per doz $1 50 net
Spring..................per doz $6 50—dis 20&10 %

Rail.
Sliding Door, Wrought Brass..................℔ ℔ 44c., dis 10 %
" Iron, Painted..........℔ foot 9c—dis 55&10 %
Barn Door, ⅛, ⅜ and ⅝ inch..................dis 60&10&10 %
" for N. E. Hangers..................dis 60&10&10 %

Rakes.
Cast Steel..................dis 35 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.
Malleable..................dis 35 %
$5 00 5 50 6 00 6 50
9 11 13 15 teeth.

Razor Straps.
Evan's..................dis 25&10 %
Genuine Emerson (B. F. Badger or C. Emerson)..................
Imitation Emerson..................℔ doz $2 75—dis 40 %
Hunt's..................dis 40 %
Chapman..................dis 10 @ 15 %
Torrey's..................dis 10 %
Saunder's..................net @ 10&10 %

Rivets.—Old Colony.
Iron and Tinned..................dis 25&7½ %
In bulk..................dis 7½ %
Copper Rivets and Burrs..................
Nos. 7 8 9 10 11 12 13 14 15
Per lb. 49c 50c 52c 54c 56c 58c 60c 65c 70c

Rivet Sets...................dis 5 @ 10 %

Rods.
Stair..................dis 40 %
" American Patent..................dis 40 %

Rollers.
Barn Door..................revised list dis 60, 10&10 %
Novelty..................dis 50 %

Rope.
Manufacturers' List of Sept. 28, 1875.
Manila..................¾ inch and larger ℔ ℔ 14½c
" ....⅝ inch ℔ ℔ 15 c
" ....¼ and 5-16 inch ℔ ℔ 15½c
Manila Lath Yarn and Tar'd Rope..................℔ ℔ 14 c
" Hay Rope..................℔ ℔ 15 c
Sisal..................¾ inch and larger ℔ ℔ 11½c
" ....⅝ inch ℔ ℔ 12 c
Sisal..................¼ and 5-16 inch ℔ ℔ 12½c
" Hay Rope..................℔ ℔ 12 c

Rules.
Boxwood. Ivory.
Chapin's..................dis 66⅔&10 % dis 10 %
Stanley..................dis 70 % dis 35 %
Standard..................dis 70 % dis 50&10 %
Stephens'..................dis 70&10 % dis 55&10 %

Sad Irons.
From 4 to 10 lbs..................℔ ℔ 3¼ @ 3½c net
Sad Iron, Nickel Stand attached..................
Self-Heating..................per doz $10 00 net
" Tailors'..................per doz 22 50 net

Sand Paper.
Beader & Adamson's Flint, 00 to 1½....$4 25 ℔ ream
" " 2, 2½ & 3. 4 75 " } dis
" " Assorted. 4 25 " } 15 %
" " Star..........℔ ream $3 25
" " Emery...℔ ream $6 50 @ 11 50
New England, same list as B. & A. Flint..................dis 15 %
H. B. & M. Roman Flint..................dis 15 %

Sash Cord.
Common..................℔ ℔ 18 @ 20c. net
Patent..................℔ ℔ 24c. net
Silver Lake, Russia Flax..................℔ ℔ 55c
" White Cotton..................℔ ℔ 55c } net
" Drab Cotton..................℔ ℔ 60c
Raw Hide..................dis 15 %

Sash Locks.
Clark's, Nos. 1 and 2, $10 00 per gross..................dis 33⅓ %
Ferguson's..................dis 25 %
Norwich..................dis 15 %
Walker's..................dis 15 %
New England..................dis 15 %

Sash Weights.—Solid Eyes..................℔ ℔ 2c

Sausage Stuffers or Fillers.
Miles..................℔ doz $20—dis 30 %
Stow or Perry..........℔ doz No. 1, $15; No. 2, $21—dis 30 %
Draw Cut No. 4..................each $30 00—dis 20 %

Saw Frames..................per gross $18 00—dis 15&10 %

Saw Rods..................$10 list, dis 10&10 %

Saws.
Spear & Jackson's old pattern..................$4 50 to £ gold
Spear & Jackson's American Pattern.......$3 55 to £ gold
John Spear..................$3 60 to £ gold
Am. Saw Co..................new list
Perforated Cross Cuts, all kinds..................68c ℔ foot
Inserted Tooth..................dis 25 %
All else..................dis 12½ %
Disston's Circular..................dis 25 %
" Mill..................dis 25 %
" Cross Cut..................dis 25 %
" other kinds..................dis 12½ %
H. W. Peace's Circulars..................dis 25 %
" Other kinds..................dis 12½ %
Wm. McNiece's Hand, Cross Cut and Circular..................new list dis 15 %
Wm. McNiece's Patent Pole Pruning Saw..................net
" Compass Saw..................
E. M. Boynton's Lightning..................dis 40 %
" Others..................dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand..................dis 25 %
" " Cross-Cut..................dis 25 %
Livingston's Butcher and Kitchen..................dis 25 %
Livingston's Framed Wood—
Nos. 101 102 103 105 106
Per doz $14 00 10 00 12 00 8 00 7 00 dis 5 %

Saw Sets.
Stillman's Genuine..................℔ doz $5 00—dis 10 %
" Imitation..................℔ doz 3 25—dis 20 %
Common Lever..................per doz $2 00 dis 10 %
Leach's..........No. 0, $8 00; No. 1, $15 00 dis 15 %
Nash's..........No. 1, $8 50; No. 2, $10 00 dis 15 %
Hammer, Hotchkiss..................$5 50 dis 10 %
" Bemis & Call's..................dis 20 %
" Aiken's Genuine..................$15 00 dis 20 %
" " Imitation..................$7 00 dis 20 %

Scales.
Hatch, Counter..................℔ doz $36—dis 25 %
" Tea..................℔ doz $15—dis 25 %
Union Platform..................$6 00, $7 50—dis 40 %
Turnbull's..................dis 15 @ 20 %
Brown's..................dis 40 %
Fairbanks'..................new list dis 15 @ 20 %
Howe's..................dis 15&5 %
Chatillon's Grocers'..................dis 20 %
" Eureka..................dis 25 %
Universal Family..................dis 25 %
Scale Beams.
No. 1 300 to 1200 lbs..........90c ℔ cwt } dis..35 @ 40 %
No. 2 " "..........75c ℔ cwt }

Scrapers.
Box, 1 Handle..................per doz $5 00, dis 10 %
" 2 "..................dis 10 %
Foot..................dis 20 & 10 %
Ship (common)..................per doz $3 00 net
Ship—Providence Tool Co..................dis 10 %

Screw Drivers.
Hart, Bliven & Mead..................dis 55&10 %
Douglass Mfg. Co..................dis 25&10 %
" No. 1..................dis 25&10 %
Disston's..................dis 40&10 %

Screws.
Flat Head Iron, List of September 1, 1875..................dis 80 %
Round Head Iron " "..................dis 75 %
Flat Head Brass " "..................dis 75 %
Round Head Brass " "..................dis 75 %
Round Head Silver Capped, List March 1..................dis 25 %
Hand Rail..................dis 55&10 %
Coach or Lag..................dis 30&10 @ 40 %
Coach, Patent Gimlet Point, List Jan. 1, 1875..................dis 40 %
Bed..................list net
Japanned, List of Sept. 1, 1875..................Net
Machine—Flat Head, Iron, List Jan. 12, 1875..................dis 25 %
" Round Head, Iron..................dis 25 %
" Round Head, Iron, " Brass..................dis 10 %
English, Flat Head, Iron; American List, Sept. 1, 1875
Nettlefold & Chamberlain's..................dis 75 %
Birmingham Sc'w Co..................dis 75 %
Birmingham Screw Co., Brass..................dis 75 %
Bench—Iron..................℔ doz $3 00—dis 10 %
" —Wood, Beach..................℔ doz $3 00—dis 10 %
" Hickory..................dis 15 %
Hand..................dis 20 %
Jack—Bell Bottom..................dis 15 %

Scythes.
Blood's German Steel, Grass....℔ doz $10 00
" Cast " "....℔ doz 11 00
" Silver " "....℔ doz 12 00
" German " Grain...℔ doz 14 00 } dis $1 50
" Cast " "....℔ doz 15 00 } from list
" Excelsior and Granger..℔ doz 11 00
" Young America..................10 50
" Silver Clipper..................13 00
Scythe Snaths..................dis 20 %

Sieves.—Mann's Patent..................New list net
14 16 18 20 24 30 mesh
Iron...$3 00 3 25 3 50 3 75 4 00 5 50 dis 20 %
Plated. 3 50 3 75 4 00 4 25 4 50 6 00
Wood Rims..........18 mesh, $1 50 per doz, dis 10 %

Shears and Scissors.
Cast Steel..................dis 75&10 %
Cast Iron..................New list July 15..........dis 50 %
Heinisch Sons' Trimmers and Scissors..................dis 65 %
" Standard quality Shears and Trimmers..................dis 40 %
Seymour's Straight Trimmers..................dis 60&10 %
" Scissors..................dis 20 %
Pruning..................per doz $10 00—dis 20 %
Barnard's Lamp Trimmers..................per doz $3 75

Sheaves.
Sliding Door, M. W. & Co. list..................dis 45&2&2 %
" R. & E. list..................dis 40&2&2 %
" Patent Roller..................dis 30 %
" " Hatfield's..................dis 50&2&2 %
" Russell's Anti-Friction..................dis 50&2&2 %
Sliding Shutter, R. & E. List..................dis 30&2&2 %

Shovels and Spades.
Ames..................dis 20 %
Birmingham Shovel Co..................dis 15 %
Rowland's..................dis 25 %
Old Colony..................new list dis 30&10 %
Middleboro' Shovel Co..................dis 30&10 %
C. E. Jennings..................New list dis 30&10 %
Dunning's Shovels and Scoops..................dis 30&7½ %

Shovels and Tongs.
Iron and Brass Head, L. & E. list..........dis 50&10&2 %
" " Hart's..........dis 55&2&10 %
Polished Steel..........dis 50&10&2 %

Skates.
Barney & Berry's
N. Y. Club..........⅌ pair $2·75 } dis 25 %
B. & B. Club.......... " 3·50
All Clamp.......... " 4·25
Rink.......... 8·00
Florence Steel..........$1·00 dis 25 %
" Spring..........3·00 dis 30 %
" All Clamp..........3·50 dis 30 %
Peck & Snyder's—
No. 1, Blued..........per pair $3·00 }
No. 2, Nickel Plated..........per pair 6·00
No. 3, " extra..per pair 8·00
Clipper Club Blued..........per pair 3·50 } dis...25 %
" " Full Pol'd..........per pair 4·50
" " " and Nickel
Plated..........per pair 6·00
Acme Club Skates.—Nos. 5 7 10 12 14
Pair $4·00 5·00 7·00 7·30 8·00 dis 20 %

Slates.
Square Frames, Round Cornered, by case......dis 65&10 %
Less than a case..........dis 65 %

Spoke Shaves.
Iron..........dis 33⅓&10 %
Wood..........dis 30 %
Bailey's..........dis 20&10 %

Spoons.
Tinned Iron..........dis 10 %
By the case..........dis 20 %
Basting..........dis 10 %
Britannia..........dis 50&5 @ 55 %
" Boardman's, new list..........dis 55 %
Rogers & Bro., A 1..........dis 50 %
Derby Silver Co..........dis 50 & 5 %
Holmes, Booth & Haydens..........dis 50 %
Nickel Silver Co..........dis 40 %
German Silver..........dis 50 @ 33⅓ %
Tin (P. S. & W.)—
Teas..........$1·50 ⅌ gross, net
Tables..........2·75 " net

Stocks and Dies...........dis 5&10 %

Stone.
Hindostan Stone..........⅌ ℔ 6c }
" Axe Stone..........⅌ ℔ 8c } dis 20&10 %
" Slips..........⅌ ℔ 10c }
Sand Stone..........⅌ ℔ 6c—dis 20&10 %
Washita Stone..........No. 1, ⅌ ℔ 30c net
" ....No. 2, ⅌ ℔ 25c net
" Slips..........No. 1, ⅌ ℔ 60c net
Arkansas Stone..........No. 1, ⅌ ℔ $1·35 net
" Slips..........No. 1, ⅌ ℔ $2·50 net
Grindstones, Family, J. F. Green & Bro..........dis 20 %
" " Loring's..........dis 10 %

Stove Polish.
Joseph Dixon's..........⅌ gross, 6 00
Gem..........⅌ gross $4·25 @ 4·50 net
Gold Medal..........⅌ gross $6 00 dis 25 %

Squares.
Steel..........dis 50 %; full cases, dis 50&10 %
Iron..........dis 50 %; full cases, dis 50&10 %
Nickel Plated..........add $2 50 @ $4 00 ⅌ doz net
Try Squares and T Bevels..........dis 45&10 %
Star Try Squares and Bevels..........dis 30 %
Disston's Try Squares No. 1..........dis 20 %
" " No. 2..........dis 40 %
" " Improved..........dis 20 %

Tacks.
Full Weight American Iron..........dis 45&7½ %
Half Weight American Iron..........dis 72½&7½ %
Carpet..........dis 7½ %
Brads American Half Weight..........dis 50&7½ %
Finishing Nails.......⅛ ⅜ ¾ 1 1¼ in. and over
⅌ ℔..........25c 20c 18c 14c 12c dis 7½ %
Trunk and Clout......⅛ ⅜ ¾ 1 1¼ in. and over
⅌ ℔..........25c 20c 18c 14c 12c dis 7½ %
Copper Tacks..........⅌ ℔ 50c—dis 7½ %
Iron Shoe Nails, ⅌ ℔ 4-8 and longer, 9½c; 3½-8, 10c..........dis 7½ %
Double Pointed..........dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co..........dis 20 %
Eddy's..........dis 20 %

Tea Trays.
American Tea Tray Co..........dis 15 %

Thermometers.
Tin Case..........dis 50&10 %

Toe Calks.
Winsted..........⅌ ℔ 15c., dis 10&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)..........dis 20 %
Wood Bottom..........per doz $12—dis 25&10 %
All Iron..........per doz $19·50—dis 25&10 %

Tinners' Tools and Machines.
P. S. & W..........dis 10 %

Traps.
Game, Newhouse..........dis 25 %
" Peck, Stow & Wilcox..........dis 30 %
" Hotchkiss.......old list dis 30 %; new list dis 10 %
" Blake's Patent..........dis 30 %
Mouse, Wood Choker..........⅌ doz holes, 15 @ 16c
" Patent Cnocker (Union Nut Co.)..........⅌ doz holes 16 @ 18c net
" Round, Wire..........⅌ doz $1 50 to 2 00 net
" Square, "..........⅌ doz 2 00 to 2 50 net
Cage, "..........⅌ doz 2 50, dis 10 %

Trowels.
Lothrop's Brick and Plastering..........dis 10 %
Disston's Brick and Plastering..........dis 12½ %
Rose's Brick..........dis 5 %
Brades' Brick..........gold. dis 10 %
Worrall's Brick and Plastering..........dis 20 %
Garden..........dis 25 %

Triers.
Butter and Cheese..........dis 25 %

Ventilators (Window).
Nickel and Gilt..........per dozen $16·00 @ 18·00

Vises.
Trenton Vises, Solid Box.
40 to 160 lbs..........16c
160 and over..........20c
Peter Wright's..........⅌ ℔ 15½c. gold
Wilson's Solid Box..........dis 25 %
31 to 160 lbs..........18c
160 and upward..........22c
Wilson's Parallel..........dis 30&10 %
Sargent's "..........dis 50&10&10 %
Backus & Union, Parallel..........dis 25 %
Buffalo, Parallel..........new list dis 25 %
Fisher & Norris' Double Screw Parallel..........dis 15&10 %
Trenton Parallel..........dis 15 %
Merrill's Parallel..........dis 15 %
Parker's..........dis 20 %
Stephens' Parallel..........dis 15 @ 20 %
Bonney's Saw Filers..........per doz $20—dis 20 %
Stearn's Saw Filers..........per doz $30—dis 20 %

Wheel Barrows.
Canal (Pugsley & Chapman)..........new list dis 15 %
Coal, Garden and Stone (Pugsley & Chapman)....dis 25 %

Well Wheels.
Revised list..........dis 60&10 %

Wire.
Brass and Copper..........dis 10 %
Bright and Annealed..........Nos. 0 @ 18 dis 45 @ 47½ %
" " .... " 19 @ 26 dis 50 @ 52½ %
" " .... " 27 @ 36 dis 55 @ 57½ %
Coppered.......... " 0 @ 18 dis 40 @ 42½ %
Galvanized, Nos. 2 to 9..........⅌ ℔ 8½ @ 9c net
Galvanized, Nos. 10 to 18..........market list dis 10 @ 15 %
Tinned..........dis 25 @ 30 %
Cast Steel..........dis 15 @ 20 %
Tinned Broom Wire..........dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9..........⅌ ℔ 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11..........⅌ ℔ 10c @ 10½c
" " " 12..........⅌ ℔ 10½c @ 11c
Annealed Fence, Nos. 8 and 9..........dis 47½ @ 50 %
" Grape, " 10 to 14..........dis 47½ @ 50 %
Fence Staples..........⅌ ℔ 7½ @ 8 %
Stubs' Steel Wire..........$7 00 to 8 gold
Judd's Picture Wire..........dis 50
Clothes Line Wire..........per coil 60c. net

Wrenches.
American Adjustable..........dis 45 %
Baxter's Adjustable "S"..........dis 20 %
" Diagonal..........dis 20 %
Collins & Co.'s..........dis 45 %
Coes' Genuine..........dis 40&5 %
" Pattern (Wrought)..........dis 50&10 %
" " (Malleable)..........dis 65&10 %
Lindsay's Patent..........dis 25 %
Taft's Pattern..........dis 70&10 %
Davis Patent Duplex..........new list dis 25 %
Bemis & Call's Patent Combination..........dis 20&5 %
" " Merrick's Pattern..........dis 25&2½ %
" " Brigg's Patent..........dis 15&10 %
Aiken's Pocket (Bright)......per doz $10·00—dis 50&10 %

Wringers.

		Less than 2 doz	2 doz lots
Providence	⅌ doz	$72·00	$70·00
Reliance	⅌ doz	69·00	67·00
Universal—Extra	⅌ doz	72·00	70·00
Novelty	⅌ doz	72·00	70·00
Sherman	⅌ doz	72·00	70·00
Wringers without Cog Wheel	⅌ doz	60·00	58·00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 10 %.

COMMON STAMPED WARE, &C.

Bucket Covers.

Quarts	½	1	2	3	4
Inch	4⅞	5 3-16	6 5-16	6¾	7 11-16
Per gross	$2·00	2·60	3·40	4·25	5·75
Quarts		6	8	10	12
Inch		8¾	9½	9¾	10 9-16
Per gross		$6·50	8·20	8·20	11·60

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11½	12½	13½
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7⅜	8½	8⅞	9½	9⅞	10½
Per gross	$5·75	6·00	6·25	6·75	7·25	8·25
Inch	10⅞	11½	11⅞	12½	12⅞	13½
Per gross	$8·75	9·50	10·00	13·00	13·75	16·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	5·50	5·50	8·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$8·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1½	2	3	4	5	6 qts.
Inch	3	3⅜	3¾	4½	5	
Per gross	$1·15	1·60	1·60	2·00	2·75	3·00
Rimmed	2⅜	3	3⅜	4	4½ inches.	
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7⅜	8	8½	9½	9	10	10½	11½
Per gro.	$6·00	6·50	6·75	7·25	7·75	9·50	10·00	12·00 13·00

Grater Plates.

Sheet	¼	½	1
Per gross	$3·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes......per gross	$8·00	11·50
With Tubes	10·50	14·00

Stamped Square Pans.
No..........½ 1
Per gross..........$7·50 14·50
Common Square Pans (One Sheet).
Per gross..........$11·50
Milk Skimmers (Plain or Pierced).
Per gross..........$4·00
Lettered Plates
Inch..........5½ 6
Per gross..........$3·25 4·00
Steamer Bottoms.
Add $1 per gross, or 10c. per doz. to list of Pot Covers.
Tin Stove Pipe Rings.
Inch.......... 4 4½ 5 5½ 6 7
Plain..........per gro.$4·00 4·50 5·00 5·50 6·00 7·00
Jap'd or Burn'd.. " 6·00 6·50 7·00 8·00 8·50 10·00
Coffee Boiler Lips.
Small. Large.
To Rivet..........per gross, $0·80 1·10
To Solder.......... " 1·25

STAMPED DEEP AND RETINNNED WARE.
Discount 30&10 %.

Plain Stamped Water Dippers.
½ pint. Pint. Quart. quarts. 2½ quarts.
Per doz .90 1·15 1·50 1·85 2·50

Retinned Milk Pans.
Qts.... 1 1½ 2 3 4 5 6 8 10 12
⅌ doz. 1·20 1·50 1·75 2·00 2·25 3·15 3·50 3·85 4·75 5·25 5·75
Dipper Bowls, Plain Stamped—
Pints..... ½ 1 Quarts.... 1 2 2½
Per doz. .50 .75 Per doz.... 1·05 1·75 2·25
Dipper Bowls Retinned—
Pints..... ½ 1 Quarts.... 1 2 2½
Per doz. .75 .95 1·05 Per doz.. 1·40 1·75 2·25

Pans.
Dish Pans, Retinned Deep—
Quarts..... 7 8 10 14 17 21 30
Per doz.... 8·50 9·50 11·00 13·00 16·00 19·00 20·00

JAPANNED TIN WARE, dis 5 %.
Canisters, Common.......Pound ¼ 1 2 3
Per gross $10·50 15·00 24·00 30·00
Canisters, Hinged.....Pound 1 1½ 2 3
Per gross $19·00 25·00 32·00 37·00 42·00
Canisters, Square.....Pound 2 4 6 8 12 16
Per doz $3·00 4·25 5·00 5·75 8·00 9·00
Candlesticks, Japanned..........No. 1 2
Per gross $8·00 7·00
Cake Boxes, Round..........per nest, $3·25
Square..........per nest, 4·25
Chamber Pails, Japanned
Nos..........2 3 4 5
Green, per doz..........$8·00 9·00 11·00 13·00
Oak.......... " $9·00 11·00 12·00 12·50
Dust Pans, Corrugated..........per gross, $22·00
Box Graters..........per gross, $6·75
Molasses Cups..........Pint ½ 1 2 3
Per gross $13·00 16·00 28·00 42·00
Lunch Boxes, per doz..........7 in. $2·00; 8 in. $2 50
Pepper Boxes Japanned..⅌ gross small, $3·00; large, $4·00
Toy Banks, House..........No. 1 2
Per gross $7·00 5·50
Toy Banks, Gothic..........No. 1, $6·00, No. 2, 4·00 per gross
Toy Cups, Straight..........No. 1 2 3
Per gross $3·75 3·25 2·75
Toy Cups, Flaring..........No. 1, $4·25; 2, $3·75 ⅌ gross
Toy Pails, Covered..........per gross $4·00
Toy Rattles..........per gross $3·50
Trunks. Wire Handled..........per nest (5) $1·75
Spittoons, Tin..........per gross, $27

PLANISHED TIN WARE, dis 20 %.
Tea Pot Handles—P. S. & W..........dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small 4¼ inches..........per gross, $11·50
No. 2, Medium, 5½ " .... " 12·50
No. 3, Large, 6¾ " .... " 13·50
No. 4, Ex. Large 7¼ in., for Wash Pitchers &c.......... " 18·50
Solid Iron. Tin Tipped.
No. 10, Small, 4¼ inches..........per gross, $9·00
No. 15, Medium, 5½ " .... " 9·50
No. 20, Large, 6¾ " .... " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W
No. 12, Bronzed and Tin-Tipped..........per gross, $13·30
Saucepan Handles. Of Best Malleable Iron.
P. S. & W..........dis 20 %
Japanned.
No. 1, 5½ inches long..........per gross, $3·50
No. 2, 6 " ....4·00
No. 3, 6¾ " ....4·00
No. 4, 7¼ " ....4·25
No. 5, 8 " ....4·25
No. 6, 9 " ....4·50
Tinned.
No. 1, 5½ inches long..........per gross, $4·25
No. 2, 6 " ....4·75
No. 3, 6¾ " ....4·75
No. 4, 7¼ " ....5·25
No. 5, 8 " ....5·25
No. 6, 9 " ....5·75
Japanned..........per lb., .16
Tinned.......... " .18
Iron Kettle Ears (P., S. & W.)..........dis 45 %
Half gross pairs in a package.
Tinned
Nos.......... 1 2 3 4 5 6 7 8
Per gross pairs...88c 1·00 1·50 1·75 2·10 2·75 3·75 4·50
Black.
Nos.......... 1 2 3 4 5 6 7 8
Per gross pairs...75c 88c $1·35 1·50 1·75 2·25 2·75 4·00
Tinned Tea Kettle Ears.
Nos.......... 1 2 3
Per gross pairs..........$1·75 2·10 2·75
Extra Heavy Tinned Kettle Ears—French Pattern.
Nos.......... 1 2 3 4 5
Per gross pairs...$1·00 1·25 1·50 1·75 2·00 2·50 3·00
Malleable Iron Kettle Ears for Coal Hods, &c.
P., S. & W..........dis 25 %
No. 10 Small..........⅌ ℔ Tinned 20c; Black, 16c
No. 20 Medium..........⅌ ℔ " 20c; " 16c
No. 30 Large..........⅌ ℔ " 20c; " 16c
No. 40 Extra Large..........⅌ ℔ " 20c; " 16c
In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 4½ in..dis 25 %
Plain, 8c.; Jap'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned..........30c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.)..........dis 25 %
Plain with drilled holes, per lb..........9c
Plain with Cast "..........8c
Plumbers' Scrapers—(P. S. & W.)..........dis 25 %
Extra quality, length 6 in., per doz..........$4·00

METALS.

IRON.—DUTY Bars, 1 to 1½ cents per lb.. Sheet, Band, Hoop and Scroll, 1½ to 1¾ cents per lb. Provided, that none of the above iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.
Foundry No. 1..........⅌ ton, $25 00 @ 25 50
Foundry No. 2.......... " 23 00 @
Gray Forge.......... " 20 00 @ 22 00
SCOTCH.
Coltness.......... " 33 00 @ 33 50
Glengarnock.......... " "
Gartsherrie.......... " "
Eglinton.......... " @ 30 00

Bar Iron.
Am. Refined, at mill..........2·4c. @ 2·6c

Rails.
American, at works, currency.......... 45 00 @ 50 00
Old Rails.......... 25 00 @ 27 00

Scrap.
Wrought Scrap.......... 31 00 @ 32 00

Bar Iron from Store.
Common Iron.
¼ to 2 in. round and square..........} ⅌ ton $57 50
to 6 in. x ¾ to 1 in..........}
Refined Iron.
¼ to 2 in. round and square.......... " 57 50 @ 60 00
1 to 6 in. x ¾ to 1 in.......... " 62 50 @ 65 00
1 to 6 in. x ¼ and 3-16.......... " 67 50 @ 72 50
Shafting Iron—5⅛ to 4 in.......... " 80 00 @ 85 00
Rods—5-16 to ⅝ round and square.......... " 110 00 @ 65 00
Bands.......... " 70 00 @ 72 50
Hoops—⅝ to 1 in.......... " 130 00 @ 80 00
Swedish Iron.
Ordinary sizes.......... " 130 00 @ 132 50
Plow size..........

Sheet Iron.

	American and English. Common	R. G. American.	R. G. English.
10 to 20 ⅌ ℔	4½c	5c	5¼c
21 to 24	4¾c	5¼c	5½c
25 to 26	4¾c	5½c	5¾c
27	5c	5¾c	6c
28	5¼c	6c	6¼c

Galvanized, 14 to 20, prime, ⅌ ℔ 8¼c; 2d quality ⅌ ℔ 7¾c
" 21 to 24 " " 9¼c " " 8¼c
" 25 to 26 " " 10c " " 9c
" 27 " " 10½c " " 9¾c
" 28 " " 11¼c " " 10½c
Patent Polished..........⅌ ℔ 14c
Russia, Nos. 8 to 16.......... " 15½c
" Stained, No. 1.......... " 11c
Belgian.......... " 10c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

⅛	3	4	5	6	7 inch.
$2·50	2·50	4·50	5·25	6·50 per doz.	

RUSSIA IRON.

4½	5	5½	6	7 inch.	
$5·00	7·00	9·50	12·00	14·00 per doz.	

COPPER—DUTY. Pig, Bar and Ingot, 5c.; old copper, 4 cents ⅌ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot..........⅌ ℔ 23¼ @ 23½c
English..........

SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot..........31c. ⅌ ℔
Braziers Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot..........31c. "
Braziers Copper, 12 oz. per square foot..........32c. "
Circles less than 84 inch in diameter..........34c. "
Circles, 84 inch diameter and over..........35c. "
Segment and Pattern Sheets..........37c. "
Locomotive Fire Box Sheets..........31c. "
Sheathing Copper, over 12 oz. ⅌ sq. ft..........31c. "
" " 12 oz. ⅌ sq. ft. and lighter..........35c. "
Bolt Copper..........35c. "
Copper Bottoms, 35c. ⅌ ℔..........net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier..........37c. By the case, 36c. ⅌ ℔
12 oz. and lighter..........40c. " " 39c. "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier..........39c. By the case, 38c. ⅌ ℔
(And all sizes not over 20 inches wide.)
30x60
14 and 16 oz. and heavier..........41c. ⅌ ℔
12 oz..........44c. "

TINNING.
14x48, by the case..........8c. ⅌ sheet
14x48, less than case..........10c. "
Other sizes not larger than 30x60..........2¼c. ⅌ sq.
Larger than 30x60..........3c. "

Brass.
ROLLED AND IN SHEETS.
For the purchase of 100 pounds and over at one time
HIGH BRASS.
All Nos. to No. 8, and widths 14 in. and under..........30c
All Nos. to No. 8, inclusive, and widths over 14 to 20 in..........33c
Over 20 in. to 30 in. inclusive..........36c
½c ⅌ ℔ advance on each No. above No. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass at..........49c
Sheets 4x48 in., and all sheets cut to particular sizes and lengths..........36c
Printers' Rules..........40c
Sheets wider than 30 in. and under 40 in..........40c
Circular sheets in diam. from 4 in. to 14 inclusive..........40c
" " over 14 in. to 20 "..........42c
" " " 20 in. to 30 "..........43c
" " " 30 in. to 40 "..........49c
" " " 40 in..........52c

LOW BRASS.
4c ⅌ ℔ more than High Brass.
Gilding Metals, 7c ⅌ ℔ more than High Brass.
Platers' or Gold Metal { In Bars..........42c
{ Sawed..........44c
FOR SLITTING: Metal in Width.
In. to ¼ in. to No. 30, inclusive, 1c ⅌ ℔ advance.
In. to 1 in., thinner than No. 30, c ⅌ ℔ advance.
In. to ¼ in., " 30, 3c "
¼ in. and less to No. 30, c ⅌ ℔ advance.
¼ in. and less thinner than No. 30 5c ⅌ ℔ advance.

BRASS AND COPPER WIRE
(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20	33	37	43
Nos. 21, 22, 23	34	38	41
Nos. 24 and 25	35	39	45

Brass Rods, No. 8 and larger, 39c ⅌ ℔, less 10 per cent. Wire straightened and cut, smaller than No. 8, special rates, not less than 6c ⅌ ℔ advance.

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 6	0·41	0·45	0·51
No. 7	0·44	0·48	0·54
No. 8	0·46	0·50	0·56
No. 9	0·48	0·54	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·73	1·03
No. 36	0·75	0·79	1·15
No. 37	0·93	0·98	1·28
No. 38	1·28	1·28	1·78

Ten cents per pound extra for Spooling.

MISCELLANEOUS.
Common Plain Brass Pail Ears..........39c net
Hose Pipes, 500 and over..........72c net
" under 500..........84c net
Door Rail..........44c—dis 10 %

TUBING
(Brown & Sharpe's Gauge.)
⅌ ℔
Plain to No. 20, inclusive..........$0·48
Nos. 21, 22, 23, 3c. advance on List for each No.
Nos. 24, 25, 26, 4c. " " "
Above No. 26 special rates.
Plain Tube, 1-4 inch..........64
" 3-16 "..........1 49
" 1-8 "..........1 74
All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20..........57
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet.
Discount on the foregoing list, 10 per cent.

LEAD—DUTY: Pig $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.
Spanish..........7c gold
German Refined..........6⅞c gold
English..........6⅞ @ 7c gold
American..........7c gold
Bar..........dis 10 %..........8⅝c.
Pipe..........dis 10 %..........8⅝c.
Tin Lined Pipe..........dis 10 %..........16c.
Sheet..........dis 10 %..........9⅝c.
Shot..........dis 10 %..Drop, 9⅝c. Buck, 10⅛c.

BABBITT METAL.
N. P. U..........⅌ ℔ 8⅝ @ 9c
A., 25c.; B, 20c.; C, 15c.; D, 12c. ⅌ ℔.

SOLDER..........No. 1, 15c.; No. 2, 14c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb. or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as steel.

American Cast Steel.
Tool..........15 @ 16c
Spring..........9 @ 10c
Homogeneous..........
Tire..........12½ @ 13½c
Machinery (round and square)..........10c
File..........11c
Sheet..........14 @ 16½c
Plow..........14 @ 16½c
Saw Plate, mill and mulay..........14 @ 15c
Saw Plate, gang and X cut..........13 @ 14c
circular as to size..........18 @ 30c

Chrome Steel.
Tool..........⅌ ℔ 20 @ 21c
Tool, extra fine..........40 @ 75c
Spring..........⅌ ℔ 12c and upward
Machinery..........⅌ ℔ 12c
Hammer..........15c
Gun or Homogeneous..........16c

English Steel.—payable in gold, net.
Best Cast..........⅌ ℔ 17½c
Extra Cast..........18½c
Round Machinery, Cast..........⅌ ℔ 10½c
Swaged, Cast..........19½c
Best Double Shear..........14c
Blister, 1st quality..........12½c
" 2d quality..........13 c
German Steel, Best..........11½c
do 2d quality..........10½c
do 3d quality..........9½c
Sheet Cast Steel, 1st quality..........15½c
" " 2d quality..........14c
" " 3d quality..........13½c
File Steel, Flat and ½ Round..........12½c
" Square and Round..........13½c
" Mill..........13½c
" Taper to 4 inch..........15c
" Taper 3 and 3½ inch..........18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.
Silesian, cash..........6⅞ @ 7c. gold
American..........7⅛ @ 11c. currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1½c per lb.; Electro-galvanized Plates, 2 cents per lb.; Manufactures of, not enumerated, 30 per cent. ad val. Bars, Blocks and Pigs, free. Banca, subject to duty of 10 per cent.
Banca..........⅌ ℔ 24 @ 24½c., gold
Straits..........⅌ ℔ 22 @ 22½c., gold
English..........⅌ ℔ 22 @ 22½c., gold

TIN PLATES, CURRENCY PRICES.
I C 10x14, Prime Charcoal..........9 @ 9·50
12x12..........9·50 @ 10·00
14x20..........9·75 @ 10·25
I X 10x14..........11·75 @ 12·25
12x12..........11·75 @ 12·25
14x20..........11·75 @ 12·25
D C 12½x17..........8·50 @ 9·00
D X 12½x17..........10·75 @ 11·25
For each additional X add..........

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$ 8·25 @ 8·50	8·25 @ 8·50	7·50 @ 8·00
I C 12x12	8·25 @ 8·50	8·25 @ 8·50	
I C 14x20	8·25 @ 8·50	8·25 @ 8·75	7·50 @ 8·00

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$ 8·25 @ 8·50	8·00 @ 8·25	7·50 @ 8·00
I X 14x20			
I C 20x28	17·25 @ 18·00	16·25 @ 17·00	16·25
I X 20x28	22·50		

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ⅌ ℔.
Sheet..........cask 10½c
" ....open 10½c

Old Metals.

(Dealers' Selling Price.)

Copper	⅌ ℔	@ 20
Yellow metal	13	@ 14
Brass	13	@ 14
Heavy Composition	14	@ 15
Old lead, solid	6	@ 6¼
Tea lead		@ 5
Wrought iron	1¼	@
Sheet iron	1	@
Cast iron	1¼	@
Machinery iron	1¼	@ 1
Zinc	5	@
Pewter, No. 1	15	@
" No. 2	10	@ 13
Spelter		

Paints, Oils, etc.

Paints.
Black lamp—Coach Painters..........⅌ ℔ 20c
" " Ordinary..........6c
" Ivory Drop, fair..........15c
" " best..........26c
Black Paint, in oil..........kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best..........50 @ 75c
" " " " in oil..........35 @ 65c
" Chinese dry..........83c
" Ultamarine..........25 @ 80c
Brown, Spanish..........1½c
" Van Dyke..........9c
Carmine, 40..........$12 00
Green, Chrome..........15 @ 23c
" " in oil..........18 @ 25c
" Paris..........good, 30c; best, 40c
" " in oil.......... " 30c " 45c
Mineral Paints..........1½ @ 4c
Orange Mineral..........11c
Red Lead, American..........9⅝c
" " English..........10½c
" Venetian (N. C.) dry..........2⅜c
" " in oil..........asst'd cans, 11c; kegs, 8½c
" Indian, dry..........10c
Rose Pink..........12c
Sienna American, Raw..........4c
" Burnt..........4½c
" " in oil..........16 @ 23c
" Raw "..........15 @ 23c
Umber, Burnt..........4 @ 8c
" " in oil..........16 @ 21c
" Raw..........3½ @ 7½c
" " in oil..........16 @ 22c
Vermillion, Chinese..........
" English..........1 25, gold
" Trieste..........1 10 "
" American, Common..........28c
White Lead, American, pure dry..........10c
" " in oil..........11c
White, Paris, English, prime..........in bbls. 2½ @ 2⅜c
Yellow Ochre, French..........2⅛ @ 2⅜c
" " " in oil....asst'd cans, 11c; kegs, 8½c
" " Vermont..........in casks 1½c
Yellow Chrome..........17 @ 27c
" " in oil..........18 @ 28c
Zinc White, American No. 1 dry..........9c
" " 1, in oil..........11c
" French (Paris)..........11c
" " in oil..........12c

Oils.
Linseed Raw..........⅌ gal. casks, 60c. bbl., 61c
" Boiled.......... " 65c. " 66c
Whale, Crude.......... "
" Bleached Winter.......... " 75c
Sperm, Crude..........bbl. 1·65
" Winter unbleached.......... " 1·90
" " Bleached.......... " 2·00
Seal, Extra Refined.......... "
Lard, Pure Winter.......... " 1·30
" Spring.......... " 1·20
Cotton Seed, Crude.......... " 60c
" Southern Yellow.......... " 65c
" White.......... "
Neatsfoot, Winter..........70c @ $1·10
Natural Lubricating..........38c @ 40c

Sundries.
Asphaltum..........9c
Benzine..........⅌ gal. 16c
Chalk..........1½c
" Block..........
Dryer, Patent, Am'n..........ass't cans, 10½c.; kegs, 9c
" " English.......... " 11c; " 9c
Flocks..........
Frostings..........50c
Glue, White..........33 @ 47c
" Sheet..........20c
Glaziers' Points, Zinc..........9c
Gum, Copal..........36c
" Damar..........35c
" Shellac, English..........75c
" " " dark..........65c
Litharge..........10c
Pumice Stone, selected Lumps..........4 @ 6c
" powdered..........4c
Putty in bladders..........3½c
" in bulk..........3c
Rotten Stone, soft, English..........8c
Spirits Turpentine..........32c
Whiting, Spanish..........¾c

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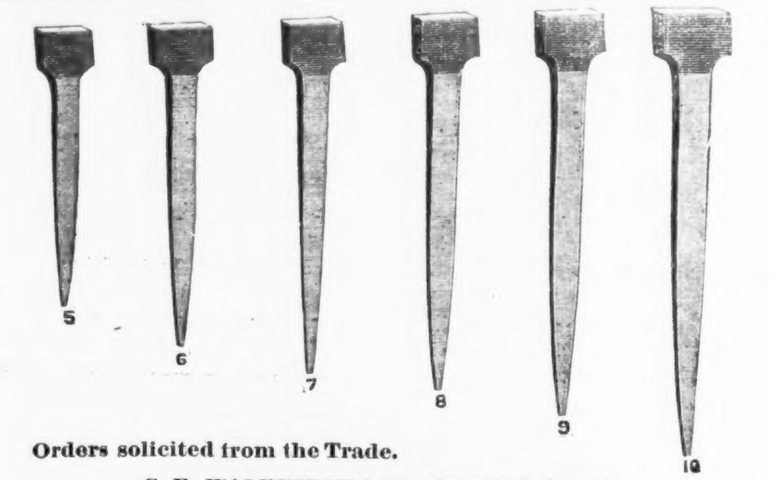

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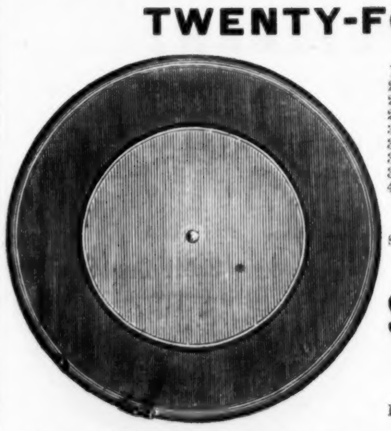

Round.	Square.	Oblong.
24 inch.	22 inch.	24x28 inch.
26 "	24 "	26x30 "
28 "	26 "	28x32 "
30 "	28 "	30x36 "
32 "	30 "	30x42 "
34 "	32 "	32x40 "
36 "	34 "	32x44 "
40 "	36 "	34x48 "

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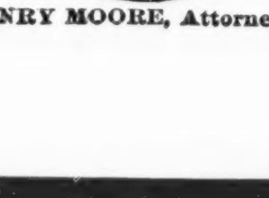

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Patent China-Lined ICE PITCHERS.

These Pitchers are made of the finest quality of whi m ctal, heavily plated with silver. They are finely engraved and chased in a great variety of decorations. The linings are of fine stone china. The top is secured to the body of the Pitcher in such a manner that it can be easily detacned and the lining removed for cleaning or other purposes.

Many improvements attained are noticeable in these Pitchers. Water and ice standing in them do not come in contact with any metal whatever. They are perfectly clean, and easily kept so. They are perfectly free from all odor or rust. Lemonade, beer, milk, etc., may be kept cool in and drank from these pitchers without endangering health. There can be nothing cleaner or purer for holding liquids than pure, white china. There is no possibility of leakage.

The construction of the Pitcher is such that the lining can be easily replaced at a very small cost.

Factories, Taunton, Mass.

Salesroom, No. 2 Maiden Lane, New York.

SECURITY. FULL SIZE OF KEY.

THE CELEBRATED

Yale Locks

FOR ALL USES.

Ornamental Real Bronze Hardware.

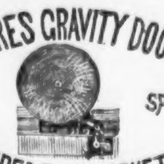
YALE LOCK MFG. CO., Stamford, Conn.

Salesroom, No. 298 Broadway, New York.

PAT. DEC 23.73

BLAKEMORES GRAVITY DOOR ALARM

USE NO SPRING



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Clark's Patent Noiseless

Pressure Blowers and Exhaust Fans,

R. W. WILD, Agent,

20 Cortlandt St., New York

Portable and Stationary Engines, Boilers, Grist Mills, etc.

EDWARD BARR,

78 John Street, NEW YORK.

Tubes for Gas, Steam & Water.

⅛ to 14 inch. **Gas, Steam Fitters', Plumbers' and Machinists' Supplies.** Boiler Tubes, Iron and Steel Boiler Plates, Rivets, Tools, Etc. Railroad Cars and all kinds of Railway Supplies. Iron and Wood Work for Cars, Bridges and Buildings.

Agent for W. C. ALLISON & SONS.

Grain Scoops

AND

Back Strap Shovels,

WITH

PATENT

CORRUGATED STRAPS,

An improvement giving great strength to the weak point of ordinary shovels. The corrugation is from A to B on both sides, not sensibly increasing the size of handle.

Hardware buyers' attention is called to the fact that this improvement will command the market.

We are prepared to fill orders for Ames', Rowland's and Myers & Armor's Scoops and Back Straps, with the Patent Corrugated Straps, at 75 cents per doz., net, above *prices of regular goods*, shipping direct from the factories. Sample orders asked.

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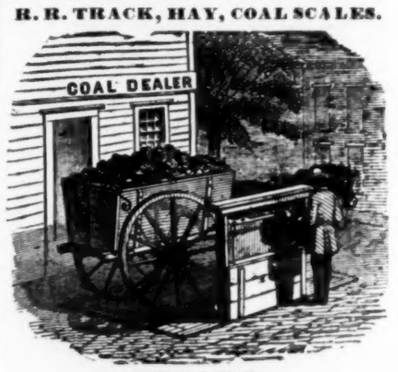
MACOMBER, BIGELOW & DOWSE, Boston.
LIVINGSTON HORSE NAIL CO., New York.
LLOYD, SUPPLEE & WALTON, Philadelphia.
PRATT & CO., Buffalo.
DUCHARME, FLETCHER & CO., Detroit.
JOHN PRITZLAFF, Milwaukee, Wis.
SEMPLE, BIRGE & CO., St. Louis.

FAIRBANKS' SCALES

R. R. TRACK, HAY, COAL SCALES.



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For Rolling Mills, Furnaces, Foundries, Miners' Use.

SCALES

For Stores, Mills and Wharfs.

SCALES

For Elevators and Grain Warehouses.

SCALES

For Farmers, Butchers, Druggists, &c., &c.

ALSO,

The Most Perfect Alarm Cash Drawer,

MILES ALARM TILL CO.'S. Also,

Herring's Safes, Coffee and Drug Mills, Letter Presses.

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FAIRBANKS & CO., 166 Baltimore St., Baltimore, Md.
FAIRBANKS & CO., 53 Camp St., New Orleans.
FAIRBANKS & CO., 93 Main St., Buffalo, N. Y.
FAIRBANKS & CO., 338 Broadway, Albanny, N. Y.
FAIRBANKS & CO., 403 St. Paul St., Montreal.
FAIRBANKS & CO., 34 King William St., London, Eng.
FAIRBANKS, BROWN & CO., 2 Milk St., Boston, Mass.
FAIRBANKS & EWING, Masonic Hall, Phila., Pa.
FAIRBANKS, MORSE & CO., 111 Lake St., Chicago.
FAIRBANKS, MORSE & CO., 139 Walnut St., Cinn., O.
FAIRBANKS, MORSE & CO., 182 Superior St., Clev'd, O.
FAIRBANKS, MORSE & CO., 48 Wood St., Pittsburgh.
FAIRBANKS, MORSE & CO., 5th & Main St., Louisville.
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E. & T. FAIRBANKS & CO.,

ST. JOHNSBURY, VT.

For sale by leading Hardware Dealers.

TWO SILVER MEDALS AWARDED TO THE
ENTERPRISE MANF'G CO. OF PA.
PHILADELPHIA,
FOR
AMERICAN COFFEE, DRUG AND SPICE MILLS.

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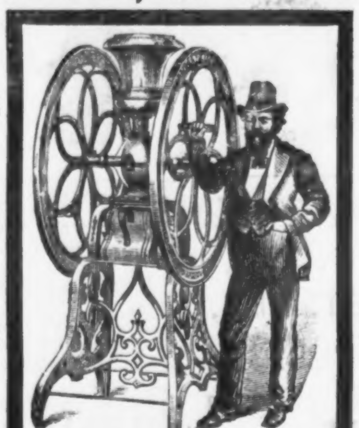
Measuring Faucets
BUNG-HOLE BORERS,
TOBACCO CUTTERS
Cheese Cutters,
CORK PRESSERS
Etc., Etc.



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AGENTS,
88 Chambers St.
NEW-YORK.

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NICKEL-PLATED HOPPERS WITH EAGLE DOME TOPS.
SEND FOR ILLUSTRATED CATALOGUE.

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Wheeling, West Va.,
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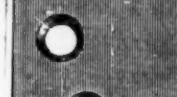
GRAHAM & HAINES, Sole Agents, 88 Chambers Street, N. Y.

AMERICAN BUTT CO.,
PROVIDENCE, R. I., Manufacturers of
Cast Butt Hinges,

AND
BUILDERS'
HARDWARE.
New York Warehouse with
Messrs. GRAHAM & HAINES,
No. 88 Chambers Street.
Send for Price List.
All kinds of
SMALL CASTINGS
Made to order.



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Greenfield, Mass.
Sole Manufacturers of the Celebrated
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EXTRA PLATED TABLE CUTLERY. PATENT FORGED OX SHOES. The only Shoe made with concavity to fit hoof. BENCH AND MOULDING PLANES of every description, &c., &c. Drop Forgings to order. Address for Catalogue with stamp.

GEORGE T. RICHARDSON. FRANK H. SCUDDER.
Middleboro' Shovel Co.
MANUFACTURERS OF
SHOVELS, SCOOPS & SPADES.

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EXCELSIOR TIN and SHEET IRON WORKS,
Successors to SMITH, BURNS & CO.,
Manufacturers of Plain, Stamped, Galvanized and Japanned
TIN WARE & SHEET IRON GOODS.
Coal Hods, Fire Shovels, Fry Pans, Water Pails, Well Buckets, &c., &c.
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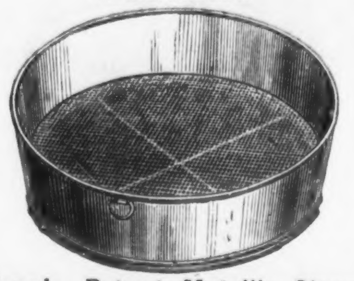
Office and Sample Rooms, 66 Beekman Street, NEW YORK.

R. J. MANN & CO.,
Sole Manufacturers of



Mann's Patent Metallic Sieve,
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The best sieve in use. To be had of all dealers.
A full assortment of these goods kept in stock at 88 Chambers Street., N. Y.
GRAHAM & HAINES, Sole Agents

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PLYMOUTH TACK AND RIVET WORKS
PLYMOUTH, MASS., manufacturer of
TACKS, BRADS, NAILS AND
RIVETS.
Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 2d, 2d and 3d Fine, Trunk, Clout, and Cigar Box Nails; Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c., &c., &c., COPPER, BRASS AND IRON RIVETS, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

COBB & DREW,
Plymouth, Mass.
Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.
NEW YORK AGENCY
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HARDWARE.
165 Greenwich Street,
Agent for the Philadelphia Star Carriage and Tire Bolts

FLUTING MACHINES.
The Celebrated K. F. M.
Manufactured for the Trade by
HENRY SOMMER,
8 to 12 Pearl Street, NEWARK, N. J.

Established in 1836.
Shelton Company,
Manufacturers of every variety of
TACKS & SMALL NAILS,
Carriage, Machine, Plow, Stove and Tire Bolts, Coach Screws, Bed Screws, &c.
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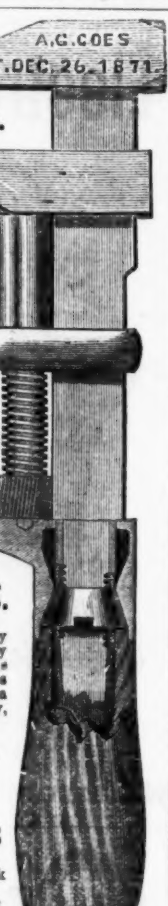
Buy the COVERT SNAP

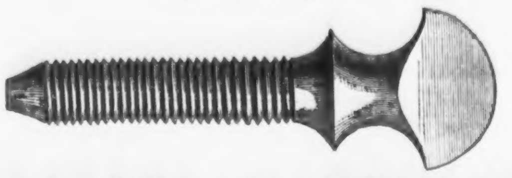
And you will buy no other. It is the most convenient, durable, safe and reliable Snap ever used. It has a brass coil spring that is four times as long as any other coil spring snap, and is enclosed in the barrel back of the bolt, making a snap which works freely under all circumstances, and without danger of having its parts broken or disarranged. We manufacture all sizes of Harness Snaps and Round Eye Snaps, and Covert's Patent Thimble to go on rope for Cattle and Horse Ties. Also other goods.
Send for price list and circulars.
HOLD BACK & SNAP CO., Troy, N.Y.



Established in 1839.
A. G. COES & CO.
WORCESTER,
Mass.,
Manufacturers of
THE GENUINE
COES'
SCREW WRENCHES.
Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using
A. G. COES'
NEW PATENT
FERRULE
Which cannot be forced back into the handle.
☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 20, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.
A. G. COES & CO.

The Hart, Bliven & Mead Mfg. Co.,
18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.
Factories at KENSINGTON, CONN.
MANUFACTURERS OF



CARRIAGE HARDWARE.

Send for Our
New
Catalogue
and
Price List.

Every style of Bands & Sockets in Silver, Nickel, Oroide & Gold Plated.

QUACKENBUSH, TOWNSEND & CO.,
Hardware, Cutlery, &c.
59 & 61 Reade Street, N. Y.

Depot for
THOS. JOWITT & SONS,
(Sheffield, England,)
FILES and HORSE RASPS.
Rough & Ready
And
CLIPPER SCYTHES,
Warranted.

Manufacturers of the

Patented March 4, 1873.

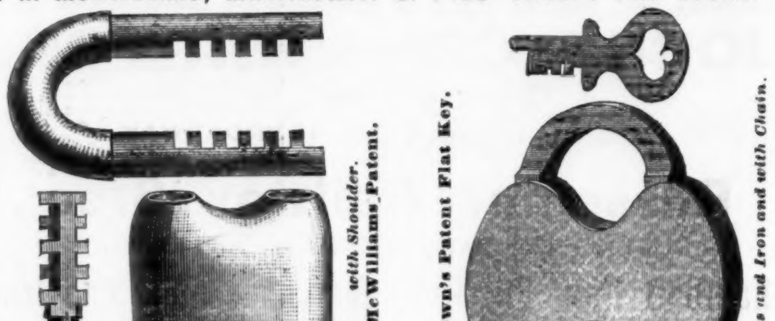
Agents for
Norwich Lock
MFG. CO.
"BEAVER"
(American)
FILES and HORSE RASPS.
"WIDE AWAKE"
AXES.

J. CLARK WILSON & CO.,
P. O. Box 2355. 81 Beekman St., New York.
The Axe for the Season of 1875 and '76.
H. CLARK'S CAST STEEL AXES.
Every Axe fully Warranted.

Western Beveled' Kentucky.

Rockaway Pattern. Long Island. New Jersey'
BRONZED OR RED.
Price per dozen.........$11 00 net cash. Beveled Axes ....50c per dozen extra.
☞ Send a Sample ORDER. ☜

J. H. McWILLIAMS, Manufacturer of PYES' PATENT PAD LOCKS.



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CAPEWELL'S
GIANT NAIL PULLER.
Saves Boxes, Nails and Labor.

Sold by all House Furnishing and Hardware Jobbers.
MALTBY, CURTISS & CO.,
MANUFACTURERS,
34 Reade Street, New York

General Agents for CAPEWELL'S LITTLE GIANT TACK HAMMER.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 6 per cent. per annum.

Anvils.—Solid Cast Steel.................... ⅌ ℔ 14c
Peter Wright's, (Advanced April 1st.) ⅌ ℔, gold, 11½c
Wilkinson's... 11c
Eagle.............list 11 cents—dis 20 @ 20&10 %
Apple Parers.—Union........................per doz $7 00
Victor.. 7 75
Domestic.. 7 75
Reading... 7 75
Bay State Paring, Coring and Slicing............ 15 00
" Peach Parers................................. 10 50
10 doz. lots 50c. per dozen discount.
Axes.—Mann's Light...............Per doz. $12 00 @ 11 50
Hunt's Light............................ 14 00 @ 12 50
Red Indian, all sizes................... 12 00 @ 11 50
Red Chieftain, all sizes................ 12 50 @ 12 00
Crown Prince............................ 12 50 @ 12 00
Augers and Auger Bits.—Pierce's Pat.
Twist Bits.......................................dis 30 %
Douglass' & Ives' Bits..........................dis 40&10 %
Connecticut Valley Auger Bits..................dis 40&10 %
Cook's Bits.....................................dis 10&10 %
Jennings' Bits..................................dis 10 %
Bates' Nut Augers...............................dis 40&10 %
Douglass' & Ives' Augers........................dis 40&10 %
Watrous' Ship Augers............................dis 10&15 %
Bonney's Pat. Hollow Augers.....................dis 25 %
Stearns' Patent Hollow Augers...................dis 25 %
Balances.—
Landers, Frary & Clark's.... } Sold on Morton's new
Morton's.................... } List..........dis 50 %
Chatillon's....
Common Spring with Hook..........⅌ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg. Co. Light Hand
Bells...dis 70 %
Common (Tissue Paper Weight)...................dis 70&10 %
Swiss Pattern Hand Bells........................dis 50 %
Connell's Door Bells............................dis 50&5 @ 50&10 %
Gt. Western & Kentucky Cow......dis 50&10 @ 50 10&5 %
Boring Machines.—Bates' Mfg. Co., complete with augers.........................dis 20 @ 25 %
Douglas Mfg. Co., complete with augers..dis 30 @ 25 %
Common Boring Machines, no Augers......$4 00 @ 3 75
Angular.................................... 5 00 @ 4 75
Bolts.—Eastern Carriage Bolts...............dis 75 %
Western...dis 75 %
Philadelphia......................................dis 60 %
" Eagle, (Coleman's)......................dis 60 %
Wrought Shutter, Stanley...................dis 50 @ 50&10 %
Braces.—Barber's...............................dis 40&5 %
Backus...dis50 %
Bartholomew's American Ball....dis 10&10 @ 15&10 %
Spofford's...dis 50 %
Butts.—Cast Fast Joint, Narrow......dis 25&10 @ 30&10 %
Cast Fast Loose Joint...........................dis 40&10 %
" Broad.............dis 35&10 @ 40&10 %
" Acorn, Loose Pin..........dis 45&10 @ 45&10 %
" Mayers & Parliament..........dis 35&10 @ 40&10 %
" Acorn Jap'd...................dis 45&10 @ 50&10 %
Wrought Loose Pin...............................dis 35 %
" Table Hinges and Back Flaps..................dis 30 %
" Narrow..dis 30 %
" Loose Joint...................................dis 35 %
Parker's Blind Butts...
Sheperd's } Discount 60 %; by the case
Garretson's } 60&10 %.
Clark's...
Lull & Porter's Hinges.....dis 60 %; by the case, 60&5 %
Garretson's Blind Butts Light No. 0.....} Discount 60 %
" Lull & Porter Pattern } By the case
Cherryiree Blind Butts..................... } 60&10 %
Chains.—German Halter.........................dis 20 %
" Coil...dis 20 %
Galvanized Pump.................................net 13 @ 13½c
Best Proof Coil Chain—
⅌ ℔..... ¼ 5-16 ⅜ 7-16 ½ 9c 8½ 8 8c gold
3-16 ⅝ 5-16 ⅜ 7-16 ½ ⅝ in.
By the cask, 560 lbs., ½c per lb. less. Common Chain, ½c per lb. less.
Chisels.—Socket Framing......................dis 60 @ 60&10 %
Socket Firmer.....................................dis 60 @ 60&10 %
Tang..dis 40&10 @ 50 %
Beatty's Framing and Firmer......................dis 2½ %
Casters.—Iron Bed.............................dis 30&10 @ 40 %
Porcelain Wheel Bed...........................dis 40&10 @ 50 %
Iron and Brass Wheel Plate......................dis 40&10 %
Porcelain Wheel...........................dis 50 @ 50&10 %
Clothes Wringers.—Universal.................per doz $72 00
Novelty..72 00
Discount on 2 dozen lots, $3 per dozen.
Coffee Mills.—Common Box and Side.......................dis 15 %
Patent Box and Side................................dis 15 %
Cutlery.—American Pocket (best)...............dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Bart Mfg. Co..................dis 60 %
Adjustable Handle........................dis 10 @ 15 %
Beatty.......................................dis 15 @ 20 %
Fry Pans.
Tinned...................................dis 40 @ 45 %
⅌ doz..$3 50 4 00 4 50 5 00 5 50 6 50 7 50 9 00 10 00
No.......0 1 2 3 4 5 6 7 8
Burnished...dis 40 @ 45 %
⅌ doz..$3 00 3 75 4 25 4 75 5 25 6 00 7 00 8 00 9 00
No......0 1 2 3 4 5 6 7 8
Files.
Nicholson Mill Files..............................new list
" Bastard..........
" Taper...........
Butcher's Mill (Advanced March 8th)...$3 25 to £ gold
" Bastard.......................... 5 25 to £ gold
" Taper............................ 5 25 to £ gold
Fluting Machines.
E. F. M.—4½ in. rolls, $5 50...................dis 15 %
" —6 in. rolls, $6 50...................dis 15 %
Mrs. Knox—4 in. rolls, $5 50....................dis 20 %
" —6 in. rolls, 7 00....................dis 20 %
Hammers.
Yerkes & Plumb's..................................dis 15 %
Hammond & Son's...................................dis 15 %
Fayette...dis 20 %
Hatchets.
Beatty's.......................................dis 15 @ 20 %
Shingling and Half. } ⅌ doz....$7 00 7 50 7 75 8 00
} No......1 2 3 8
Yerkes & Plumb....................................dis 15 %
Shingling and Half. } ⅌ doz....$7 00 7 50 8 00 8 50
} No......1 2 3 4
Claw.... } ⅌ doz............$7 50 8 00
} No..............1 2 3
Hinges.
Strap and T, (Changed March 24)...................dis 45 %
Horse Nails.
Ausable.......................... 27 25 24 23 22
Globe............................ 26 24 23 22 21
Brundage......................... 26 24 23 22 21
Nos. 6 7 8 9 10
Putnam........................... 28 26 25 24 23
On Ausable, Globe and Brundage 1000 lb lots......dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination........................new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim...................................dis 5 %
Locks and Latches.—Rim and Mortise..........dis 40 %
Extra discount for cash 2 %
Till and Cupboard.................................dis 25 %
American Padlocks.................................dis 40 %
Extra discount for cash 2 %
Scandinavian Pad Locks.
⅌ doz.....$10 00 10 50 12 00 12 00 13 00 15 00 } dis 15 %
No.............6 8 10 10¼ 11 11½ }
⅌ doz.....$15 00 18 00 18 00 22 00 } dis 15 %
No.............12 12¼ 13 15 }
Trunk Locks..................................dis 5 @ 10 %
Tucker and Roggens Latches.......................dis 25 %
Lanterns.—Square Candle and Oil...............dis 10 %
Globe for Oil....................................dis 10 %
" Kerosene....................................dis 10 %
Tubular Lanterns..................................dis 10 %
Mattocks.—Long and Short Cutter..............dis 25 %
Western Pattern...................................dis 25 %
Pennsylvania Pattern..............................dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets..........dis 20 %
Stebbins' Gates.............................dis 62½&10 %
Lincoln's "..............................dis 10 @ 50 %
Landers, Frary & Clark's Petroleum...........dis 15&10 %
Taylor's Petroleum Faucets.....................dis 20&10 %
Brass Liquor Cocks.............................dis 20&10 %
Meat Cutters.—Dixon's.........................dis 20 %
Woodruff..dis 20 %
Stowe...dis 20 %
Hale's..dis 35 %
Stuffers..dis 20 %
Planes.—Auburn Tool Co. "Bench"...............dis 40 %
Second Quality...................................dis 50 %
Metallic Plane Co...............................dis 25&5 %
Evans Pat. Circular...................................net
Plumbs and Levels.
Adjustable......................................dis 60&10 %
Non-Adjustable..................................dis 60, 10&10 %
Plane Irons.—American.........................list net
Butcher's.....................................gold £, $5 50
Picks.—Philadelphia...................................net
Pittsburgh...net
Rules.
Boxwood..........................dis 60, 10&10 @ 70 %
Rakes.—Cast Steel Garden..................dis 40 @ 40&5 %
Malleable Garden.............................dis 40 @ 40&5 %
Wood Head Iron Teeth.............................dis 40 %
Steelyards.—American Pattern..................dis 15 %
⅌ doz.....$8 50 7 00 9 00 1 00 11 00 12 00
No.........50 100 150 200 250 300
English Pattern...................................dis 15 %
⅌ doz.....$7 00 8 67 10 67 12 67 14 67 16 67
No.........30 50 100 150 200 300
L. F. & C. Excelsior..............................dis 10 %
⅌ doz.....$8 00 9 00 10 00 12 00 15 00 18 00 21 00
No.........50 100 150 200 250 300
Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened........................⅌ doz. $10 00 net
Golden Clipper No. 3, Boxed and Sharpened......................................$9 75 net
Green Clipper No. 3, Boxed and Sharpened......................................⅌ doz $9 50 net
Allens'.. $9 50 @ 9 00
Common Scythes.................................⅌ doz $7 50 @ 8 00
Squares.—Steel and Iron, new list..............dis 50 %
Saws.—Disston's Cross Cut.....................dis 15 %
Disston's Hand....................................dis 12½ %
W. McNiece's H'd, Cross-Cut & Circ'r, new list.dis 15 %
Boynton's Lightning, new list....................dis 40 %
" Champion...................................dis 45 %
Shovels and Spades.
Rowland's Plain Back, Jon. 23d.....................dis 40 %
" Back Strap.................................dis 40 %
Oliver Ames & Sons.................................dis 20 %
Brady Shovel Co.................................dis 20&5 %
Sad Irons.—Richmond (polished face)........per lb. 3½c
Richmond (polished face).........by the cask 3¼c
Stone.—Arkansas Oil, No. 1..................⅌ ℔ $
Turkey Oil, No. 1...................................
Washita Extra.................................net 85c
" No. 1.......................................net 80c
" " 2.......................................net 25c
" 5½c

Screws.—Iron...........new list, Sept. 1st, 1875, dis 30 %
brass..dis 30 %
Spoons.—
Plated...................................dis 40&10 @ 50 %
Britannia, Boardmans (new list)..............dis 50&10 %
" Parkers (old list)..............dis 50 @ 50&10 %
German Silver......................................dis 30 %
" Light......................new list dis 35 %
Lalance & Grosjean Iron............................dis 10 %
Springs.—Gray's Door..........................dis 60&10 %
Torry's Door......................................dis 60&10%
Stocks and Dies.................................dis 10&5 %
Stove Polish.—Gem.........................⅌ gross, $5 00
Onyx...$5 00
Try Squares.—Winterbottom...................dis 10 @ 15 %
Stanley Rule and Level Co.......................dis 45&10 %
Willis Thrall, No. 2............................dis 30&10 %
Disston's No. 2....................................dis 40 %
Tacks, &c.—Half Weight Tacks....................dis 72½ %
" " by the case...dis 72½&7½ %
Clout and Finishing Nails.............................7½ %
" " by the case............dis 7½ %
Traps.—Genuine Oneida—Newhouse list.............dis 20 %
Imitation " "..................dis 30 %
Vises.—Solid Box, currency....................⅌ ℔ net 14c
Wrenches.—Coes Genuine....................dis 40 @ 40&5 %
Coes Imitation Wrought Bar...............dis 50&50&10 %
" " Malleable Bar..................dis 60&10 %
" " (Kellogg) Malleable Bar.........dis 65&10 %
Tafts Pattern (Wrought Bar)..............dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex..................dis 25 %
" " " Improved Baxter........dis 25 %
" " " Adjustable Fork.........dis 25 %
Wire.—No. 0 to 18.....(Advanced April 24th)..dis 42½ %
No. 19 to 26.......... " "..dis 47½ %
No. 27 to 36.......... " "..dis 52½ %
Coppered 0 to 12..............................dis 15 @ 20 %
Tinned Broom Wire.................................dis 35 %
Galvanized Wire No. 1 to 18........................dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
August 9, 1875.

Augers—Snell Mfg. Co...............................dis 25 %
Axes—Francis...11 50
Bits, Auger—Snell Mfg. Co..........................dis 25 %
Phœnix..dis 25 %
Bells, Cow—Yaw's Genuine...........................dis 40 %
Braces—Bit, Spofford's Patent......................dis 20 %
Brads, Cut...dis 50 %
Boards—Stove, Brooks' Pat. dis 35 % 4 mos.; 35&5 % 30 dys
Butts—Brass..dis 30 %
Wrought Narrow.....................................dis 30 %
" Broad, Loose Joint......................dis 35 %
" Table and Back Flaps....................dis 35 %
Wrought Butts, Loose Pin...........................dis 30 %
Belting—Rubber.....................................dis 35 %
Leather, new list, oak tanned..............dis 30 @ 10 %
Brick—Bath (box of 2 doz) Best English.............$1·25
" Rutherford......................................
Can Openers—Sprague's..............................$1·00
Cases—Parlor Coal Hod..............................dis 50 %
Chalk—White, Carpenter's...........................dis 15 %
Red, Carpenter's........................⅌ gross, 57c
" 90c
Chisels—Firmer Socket......................dis 60, 10&10 %
Framing Socket..........................dis 60, 10&10 %
Corner Socket Chisels...................dis 60, 10&10 %
Slick's Carpenters'.....................dis 60, 10&10 %
Castings—Malleable...............................⅌ ℔ 9½c
Egg Beaters—"Peerless"........................per doz $3·60
"Centripetal"..................................per doz 5·00
Elbows—Corrugated........ 5 5½ 6 7
Charcoal............$3·50 4·50 5·25 6·50 } dis 10 %
Russia...............7·00 9·50 12·00 14·00 }
Files—Maischoss Bros...................................
Fluters—Geneva Hand................................dis 50 %
Freezers Ice Cream—"Champion"................⅌ doz. $15·00
Hammers—Henry W. Kip's.............................dis 33⅓ %
Hinges, Gate—Shepard's.............................dis 10 %
Hinges—Window Blind—......................dis 30&10 %
Shepard's and Standard...................dis 60&10 %
Wrought Strap and T.......................dis 33⅓&10&5 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 15 %
Funnel, Black and Galvanized................" dis 15 %
Fancy and Helmet............................" dis 15 %
Sad Irons...
Kettles—Brass...8½c
Copper, "Hand Made"...............................⅌ ℔ 45c
Enameled...............................38c. @ 40c.
Knives, Drawing—Oval No. 1...................dis 50&10 %
Razor Blade..............................dis 60, 10&10 %
Lanterns "Peerless....No. 1 5 10 dis 60&10 %
⅌ doz $36 00 $10 50 $13 75 dis 10 %
Tubular...$11·00
" with Guards...11·50
Machines—Apple Paring, "Keystone".............7·75 ⅌ doz
Machines—Boring, Snell's...........................dis 20 %
Mills, Coffee—Box and Side, common.................dis 15 %
Box Union and Eagle...............................dis 15 %
"American"..dis 20 %
Molasses Gates—"Self Measuring"....................dis 20 %
Nails—Clout and Finishing..........................dis 7½ %
Shoe...dis 7½ %
Horse, Ausable........No. 6 7 8 9 10
30 27 25 24 23 22c
" " Pointed & Polished........add 1c ⅌ ℔
" " 1000 lbs.................................dis 5 %
" Clinton...............No. 6 7 8 9 10
21 19 18 17 16c
Packing—Rubber.....................................dis 30 @ 10 %
Paint—White Lead, U. S. Gov't...................⅌ ℔ 8½c
Pans—Dripping....................................⅌ ℔ 10c
Rivets—Iron, Black and Tinned..................dis 25&7½ %
Screws—"American Screw Co"—
Flat Head, Iron....................................dis 62½ %
Flat Head, Brass...................................dis 52½ %
Skates and Straps—White's..........................dis 20 %
Spoons, Iron Tinned................................dis 10 %
" by the case............dis 20 %
Plated Rogers' A No. 1.............................dis 50 %
Britannia......................................dis 50&10 %
Squares—Steel and Iron......................new list 50 %
Scales—Buffalo Scale Works.........................dis 25 %
Fairbanks..dis 15 %
Stove Polish—Gem...............................⅌ gross, $4·50
" Dixon's...6·00
Tacks—Half Weight Am. Iron.....................dis 72½&7½ %
Vases—Palace Coal..................................dis 15 %
Vises—
Parallel, Buffalo...Old pattern, dis. 30 %; new, do. dis 20 %
Ware—French, Tinned and Iron.......................dis 20 %
Stamped and Japanned...............................dis 5 %
Cast Iron Hollow...................................dis 40 %
Wire—Bessemer Steel................................dis 10 %
Tin Plates.—Add for each X.......................2·50
10x14, IC. Charcoal...$10·00 | 14x20 C. terne.......$9·00
12x12, " ... 10·50 | 20x28 C. " ....20·00
12½x17, " ... 9·50 | 20x28 X. " ....26·00
14x20, " ... 11·00 |
Pig Tin—Straits.............................24c @ 25c
Bar Tin..26c
Solder—No. 1, Crook's..............................16 c
Sheet Zinc—
"Lasalle".....................570 100 ℔ casks
$10·75 11·05 ⅌ 100 ℔s
Sheets...$10·75
Babbitt Metal......................................⅌ ℔ 12c
Iron Wire—Bright and Annealed....................dis 45 %
Coppered...dis 40 %
Tinned...dis 25 %
Tinned Broom, { Nos. 20 21 22 } ....dis 35 %
{ 20c 21c 21c }
Copper—Sheathing 14 @ 18 oz...................⅌ ℔ 30c
Planished.....................................⅌ ℔ 37c @ 39c
Bottoms...⅌ ℔ 33c
Bolts...⅌ ℔ 31 @ 33c
Braziers' Sheets..............................⅌ ℔ 31 @ 33c
Sheet Iron.—
18 Common...$4 05
24 Common...4 25
26 Common...4·45
24 W. D. Wood & Co., Smooth Finish....................5 30
Am. Russia..................................A. B.
14c 11c
Gen. Russia, No. 1 stained..........................16½c
" " clean............................15½c
Galvanized...dis 30 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.
August 2d, 1875.

Tin Plate.—I. C. 10x14 Charcoal.........$10 50 @ 11·50
I. X. 10x14 Charcoal.......................12 50 @ 14·00
I. C. Terne 14x20..........................9·50 @ 11·00
I. C. Terne 20x28..........................20·50 @ 22·00
I. C. 20 inches Continuous..............................21·00
Block Tin.—
Pig..⅌ ℔ 26c
Bars...⅌ ℔ 27c
Solder.—
A 1..⅌ ℔ 16c
Roofing..⅌ ℔ 17c
S. & Co..⅌ ℔ 21c
Lead.—Pig..................................⅌ ℔ 7c @ 7½c.
Bar..⅌ ℔ 8½c
Copper.—
Ingot...⅌ ℔ @ 24c
Planished.. " @ 38c
Sheathing.. " @ 31c
Copper Drops....................................... " @ 34c
Sheets.. 6 to 7 lb.................................... @ 37c
" 8 to 9 lb.................................... " @ 35c
" 10 to 12 lb.................................. " @ 33c
" 13 lb. up.................................... " @ 31c
Copper Bottoms..................................... " @ 33c
Zinc. Cask, 500 to 1000 lbs..............⅌ ℔ 10½ @ 10¾c
Case, 100 lbs...................................." 10¾ @ 11 c
Slab..7½c
Brass.—Roll, No. 6 to 30..........................⅌ ℔ 30c
Roll, No. 30 to 38...................................." 29c
Wire, No. 0 to 20....................................." 35c
" 20 to 35..." 40c
Babbit Metal.—Sellew & Co.........................." 38c
Allens'..." 20c
Market.." 12c
Antimony.......................................⅌ ℔ 17c
Bismuth.....................................⅌ ℔ $4 00
Nickel......................................⅌ ℔ $3 50
Russia Iron.—Bundle...........................⅌ ℔ 17c
Less than bundle.................................⅌ ℔ 18c
No. Stained..................................⅌ ℔ 15c @ 16c

Sheet Iron.

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'f'd.
15 to 20	4c	5·10c	7·10
22 to 24	4·10c	5·20c	7·20
26	4·30c	5·30c	7·30
27	4½c	5½c	7·50
30	5½c		

Galvanized Iron.—Full bundles.............dis 27½ %
Nos. 18 to 20..........12c | No. 26......................14c
22 to 24..........13c | 27.........................15c
Bar Steel.—Silver, ⅌ ℔ 16c Crescent, 21c.
Iron Wire.......................................dis 33 %
Enameled Ware...................................dis 30 %

One Piece Corrugated Elbows..............dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch........⅌ doz	$2·50	4½ inch........⅌ doz	$5·00
5 "	3·50	5 "	7·00
5½ "	4·50	5½ "	7·50
6 "	5·20	6 "	12·00
7 "	6·50	7 "	14·00

Leader Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	⅌ doz.		⅌ doz
2-inch	$1 75	2½-inch	$2 75
3-inch	2 25	3½-inch	3 25
4-inch	2 50	4½-inch	3 50

Sheet Iron Bread Pans.......................⅌ ℔ 8½c
American Broilers..........................⅌ doz. $13·50
Tinmen's Machines.................................dis 5 %
Sad Irons..................................⅌ ℔, 3½ @ 3¾c
Brass Kettles.—Ansonia.............................45c
Dog Irons..3½c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, specifications to include Bands, small Rounds and Ovals, 2·5c. rate, 2 % off net.

Flat Rail (1¼x¼), punched and coun'sunk..4·1c ⅌ ℔ net
Iron Wedges.................................4½c ⅌ ℔ net
Norway Nail Rods............................8½c ⅌ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)...............4½c ⅌ ℔ net
Beetle Rings.................................8 c ⅌ ℔ net
Fence Pickets—
⅝ round, bent to shape, 25c ⅌ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts.........................75 % off net
Carriage and Tire Bolts delivered on cars or boats in Pittsburgh.
Stove Bolts.....................................20 % off net
Machine and Square Head Bolts...............40&10 % off net
Coach and Lag Screws........................40&10 % off net
Bolt Ends.......................................40 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅝ in.................8½c ⅌ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in...............6¾c ⅌ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅝ in.................9¾c ⅌ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in................7¾c ⅌ ℔ off net
Nuts and Washers in 25 lb. boxes, ½c ⅌ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ⅌ ℔ ex. Nuts and Washers in 5 lb. boxes, 1c. ⅌ ℔ ex. net prices.
Standard Caps, for Plows........................5½c. ⅌ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 3½c ⅌ ℔ net; ¾, ⅞ in. diam. 3½c ⅌ ℔ net; ⅝ in. diam. 3¾c ⅌ ℔ net.
Patent Headed Harrow Teeth, packed in boxes ½c ⅌ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5c ⅌ ℔ net; 9-16 in. diam. 6c ⅌ ℔ net; ½ in. diam. 7c ⅌ ℔ net. 1c ⅌ ℔ extra when less than 1 keg of each size is ordered.
Strap & T Hinges...33⅓&10 % off net, delivery as custo'ry
Screw Hitching Rings.......................$5 25 ⅌ 100 net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long..............⅌ ℔ 3¾c net
1 to 2 in. diam. from 4 to 8 ft. long........" 4 c net
1 to 2 in. diam. from 1½ to 4 ft. long......" 4½c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long........" 4½c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 5 c net
Bridge bolts with upset ends.................¾c. ⅌ ℔ extra
Wrought iron plates, punched.................4¾c. ⅌ ℔ net
Cast Iron Washers............................⅌ ℔ 3¾c net
Duck Nest Tuyere Irons.................$14 50 ⅌ doz net

WAGON HARDWARE.

Wagon Box Strap Bolts—

Length		Diam. at Screw End			No.		⅌ set
10 in. long	by	7-16	at Screw End,	⅌ set of	8	bolts..	45c
12	"	½	"	"	8	" ..	55c
10	"	9-16	"	"	8	" ..	65c
12	"	9-16	"	"	8	" ..	70c
14	"	9-16	"	"	8	" ..	80c
10	"	⅝	"	"	8	" ..	80c
12	"	⅝	"	"	8	" ..	80c
14	"	⅝	"	"	8	" ..	90c
16	"	⅝	"	"	8	" ..	1 00
18	"	⅝	"	"	8	" ..	1 10
20	"	⅝	"	"	8	" ..	1 20

5c ⅌ set for each additional inch over 14 in All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each...................15c
" " wide track, each...................17c
Single Tree Irons, ⅌ set of four pieces................30c
Wrought Iron Bolster Plates, 2¾ in. wide, ⅌ set......45c
" " 3 " "......50c
" " 3¼ " "......55c
" " 3½ " "......60c
Wagon Brake Ratchets, each.............................14 c
" " " finished with guard, each..40 c
Wrought Hammer Straps, heavy pattern, each......13 c
" " " light " each......12 c
" Rub Irons, each..9 c
Stay Chain Hooks, each.................................5½c
Double and Single Tree Clips, figure 1, each..........8 c
" " " " 2, each..........9 c
" " " " 3, each..........11 c
Axle Clips, Round Part ⅝, Flat Part 1¼, each.........8c
Wagon Clevis, including Pin, complete, each..........10c
Pole Caps, each..24c
Single Tree Hooks, Nos. 1 and 2.......................4½c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks, Clevis and Pin, Clips, Single Tree Hooks, and Pole Caps, in lots of 50 sets....................dis 15 %
Wagon Box Staples, 1½ to 2¼ in. to clinch. ⅌ 1000 $11 00 net
" " " Bevel Box Iron, to rivet on. ⅌ 1000 7 50 net
Neck Yoke Eyes, each...................................4½c net
" " with ⅝ rings, each....................7½c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam.........⅌ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ½ in. diam. all lengths.....................❝ 8½c net
Wagon Rivets, 3-16 in. diam., all lengths.........❝ 9½c net
" ⅜ to 1 inch long.................⅌ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes....❝ 1c extra
" in 25 ℔ wood " ....❝ ½c extra
Wagon and Hinge Nails, ¼ in.......................⅌ ℔ 17 c net
" " " 3-16 in..........................❝ 19 c net
Wagon Rivets and Nails, in less lots than one keg each size.......................❝ ½c extra
Double Tree Plates.....................................❝ 5c net
Coupling "..❝ 5c net
Tongue "..❝ 8½c net
Neck Yoke Plates.......................................❝ 10½c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ⅌ ℔ as Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in. ⅌ ℔ 10½c net. ¼ in., 11½c. net
Above prices are free on board cars in Pittsburgh. Subject to change of market, without notice.

DETROIT.

(Reported by Messrs. Jewett & Root.)
August 30, 1875.

Tin Plate.—Best Charcoal
IC, 10x14..............$10 25
IX, 10x14..............13 00
XX, 10x14..............15 75
IC, 12x12..............10 75
IX, 12x12..............13 50
IC, 14x20..............11 25
IX, 14x20..............14 00
XX, 14x20..............16 75
XXX, 14x20.............19 50
XXXX, 14x20............22 25
DC, 100 Plate..........9 75
DX, "..................12 50
DXX, "................15 25
DXXX "................18 00
DXXXX 100 Plate.......20 75
IX, 14x14..............21 50
IC, 10x14 W............9 75
IX, 10x14 W...........12 50
Roofing Tin.—Best Char.
IC, Terne, 14x20.......$ 9 50
IX, " 14x20.........12 25
IC, Terne, 20x28.......20 00
IX, " 20x28.........25 00
Coke Tin.—
IC, 10x14 Coke.........$ 9 25
IX, 10x14, Coke.......12 00
IC, 14x20, "..........10 25
Solder.—No. 1........16c
No. 2..................15c

Pig Tin.—
Large Pigs...............24c
Small Pigs...............25c
Bars.....................26c
Bright Wire.
63 lbs. in bdl.......dis —
Copper.—
Sheathing................31c
Copper Bottoms...........32c
Planished Copper.—
Sheathing, 14x48.........38c
Boiler Size, No. 7.......40c
" " No. 8.........40c
" " No. 9.........40c
Sheet Iron.—
No. 18 Am. Com...........4 00
No. 24 Am. Com...........4 20
No. 26 Am. Com...........4 40
No. 27, Am. Com..........4 60
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $5 00
" 21 to 24...............5 20
" 25 & 26................5 40
" 21 to 24 Char'l........6 70
" 25 & 26 "..............6 90
RUSSIA.
Genuine..................17c
Imitation................14c

Watchman's Improved Time Detectors.

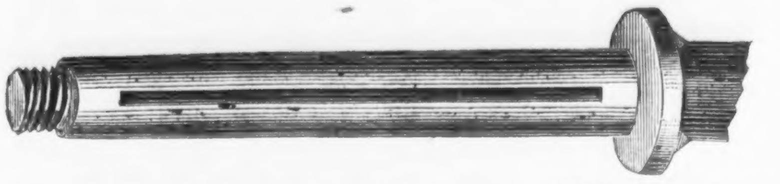
This is the latest and most complete instrument invented, with 12 keys for 12 stations. Send for circular to IMHAUSER & CO., 212 Broadway, N. Y. P. O. Box 4798.

U. S. Patent, April 22, 1873.

Send 50 cents for 6 samples (Prepaid) of
HAMMOND'S WINDOW SPRINGS.
For supporting and locking upper and lower sashes of all windows. Not a coiled spring, but one forged from best materials.
W. S. HAMMOND, Lewisberry, York Co., Pa.

TACKLE BLOCKS
BURR & CO.,
Manufacturers of Waterman and Russel's
Patent Iron Strapped Blocks,
ALSO, MANUFACTURERS OF
ROPE STRAPPED BLOCKS.
31 PECK SLIP, NEW YORK.

Guy C. Hotchkiss, Field & Co.,
85 First St., Brooklyn, E. D., and New York City.



We call the attention of the Hardware trade to our specialties in CARRIAGE MAKERS' MATERIALS and MACHINES.

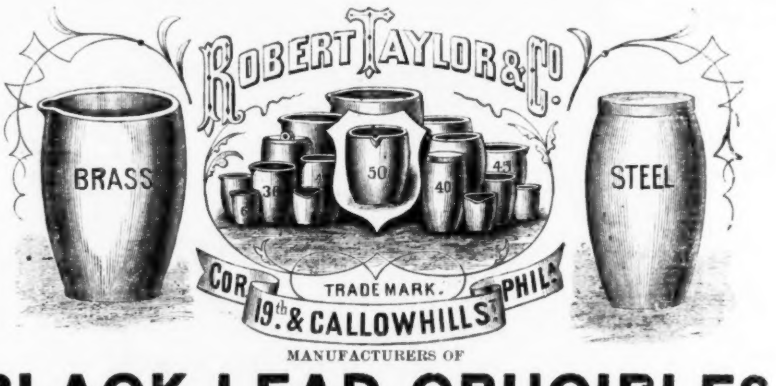
Axles of Superior Quality of all Styles

lower than any manufacturers in the country.

Lubricating Axles, as per. cut have proved superior to any other style; the continuous recess catches all foreign substances which may gather inside the box, and also serves as a receptacle for lubricating compound until drawn out by the attraction produced by the revolution of the wheel. It being placed in the central upper part of the axle, there is no possibility of small fragments working down the sides of the arm and grinding, as experiment has proved, occurs on axles made with detached recesses distributed over the upper surface of the arm. Springs all grades at lowest market prices.

Bolt Cutting Machines, Drills, TIRE BENDERS, all styles from $7 to $50, less trade discounts. Drills, &c., &c.

FOR MELTING ALL KINDS OF METALS,
And Manufacturers of
Sunny Side Stove Polish.
Lumber Pencils, Foundry Facings and Lubricating Plumbago.
STROW, WILE & CO.,
Nos. 1324, 1326, 1328, 1330, 1332 & 1334 Callowhill St., Phila
GENERAL AGENTS:
Messrs. HALL & CARPENTER, 709 Market St., Phila.

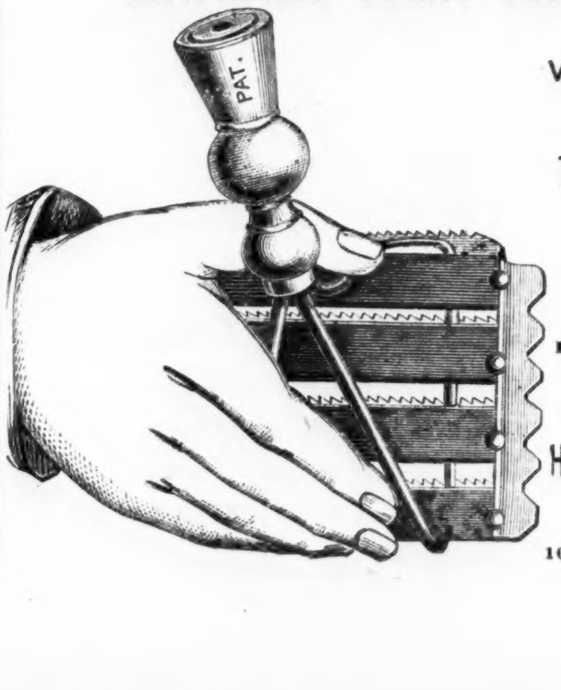


MANUFACTURERS OF
BLACK LEAD CRUCIBLES
Of all Sizes and Forms for melting
Steel, Brass, Gold, Nickel and all kinds of Metals.

Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

ROBERT TAYLOR & CO.,
No. 1900, 1902, 1904 & 1906 Callowhill, St., Philadelphia.
General Agents. { MERCHANT & CO., 507 Market Street, Philadelphia.
{ PARK & CO., 122 Second Avenue, Pittsburgh, Pa.

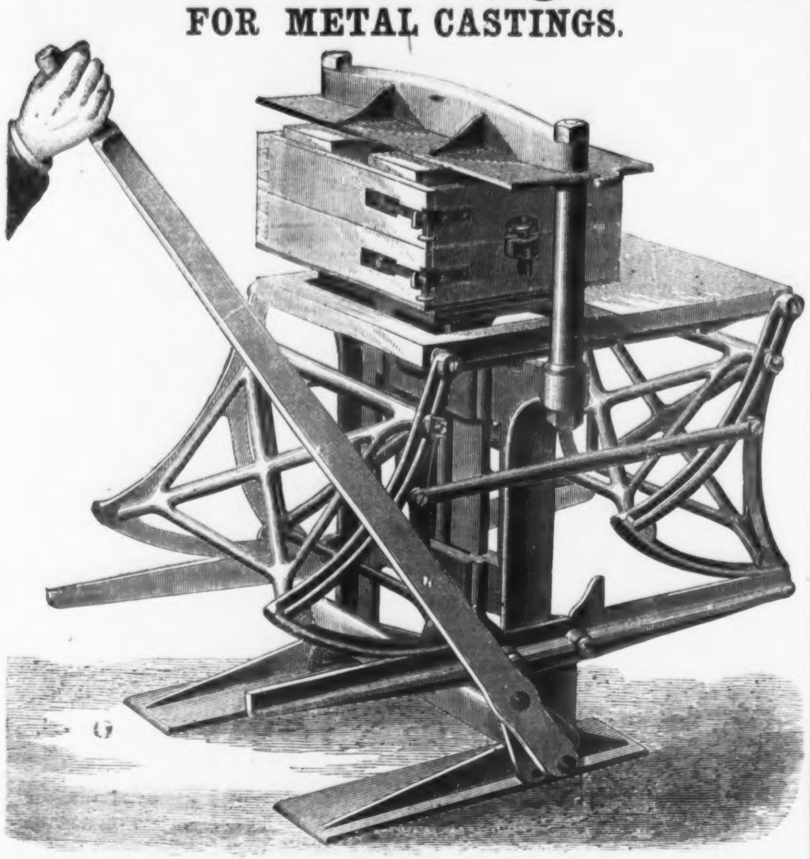
THE PERFECT COMB,
MADE BY THE
LAWRENCE CURRY COMB CO.



WITH
WIRE BRACES.
All Wrought Iron.
The BEST,
STRONGEST and
Most DURABLE
COMB Ever Made.
Patented: May 5, 1874.
Nov. 17, 1874.
Aug. 24, 1875.
FOR SALE BY
Hermann-Boker & Co.
101 & 103 Duane St., N. Y.

Eames' Pat. Molding Machine

FOR METAL CASTINGS.



The above machines have recently been introduced in several large iron foundries in this country, where they have given entire satisfaction. Among the advantages are :

1st. A great saving in the cost of producing castings.

2d. A man can learn to mold with the machine in less than 30 days' time.

3d. The castings produced will be found more perfect, less poor work, and more uniform than if molded by the old method.

The machine is adapted for either Iron or Brass Castings. *Price Reduced.* For further particulars, send for Circular. Address,

P. & F. CORBIN,

EXCLUSIVE LICENSES,

Also Manufacturers of ***Architectural Bronze Work, Locks, Hinges and fine Builders' Hardware generally.***

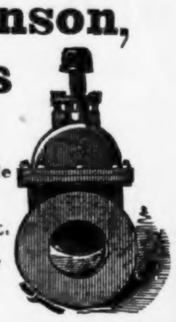
New Britain, Conn. New York, 87 Chambers St.

Armstrong & Hutchinson,

Manufacturers of

PATENT STOP GATES

For Water, Gas and Steam,



From 2 in. to 50 in. diameter.

Also, **Fire Hydrants, Single and Double Nozzle.**

Improved Boiler Feeders, Etc.

Cor Park Way & Sandusky Sts., ALLEGHENY, PA.

Send for Circular.

Fitchburg Machine Co.

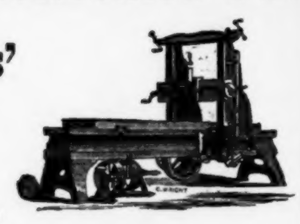
Manufacturers of

Machinists' TOOLS.

Office and Works,

Sumner Street,

FITCHBURG, MASS.



CENTENNIAL
SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,

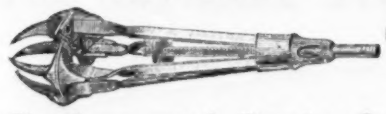
SOLE MANUFACTURERS,

Office, 1321 Fairmount Ave., Phila.

PATENT APPLIED FOR. Send for Circular.

THE NATIONAL STEEL TUBE CLEANER.

Patented July 28, 1874.



Guaranteed to clean better, last longer & work easier than any in the market.

REMOVES ALL

Carbon and Scale from the Boiler Tubes.

ADOPTED AND IN USE BY UNITED STATES NAVY.

For sal by dealers.

THE CHALMERS SPENCE CO. Foot of East 9th St., New York, Agents for the United States.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

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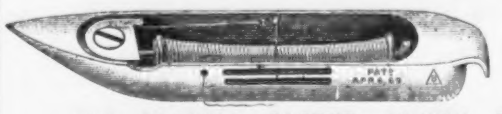

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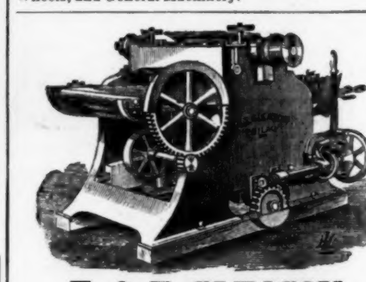

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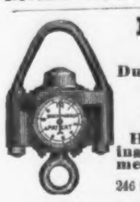
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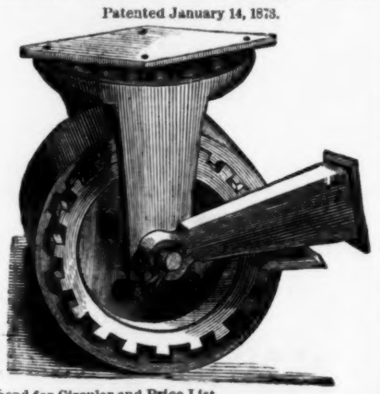
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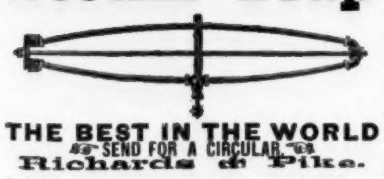
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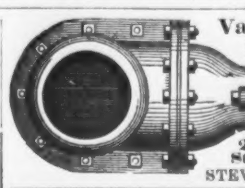
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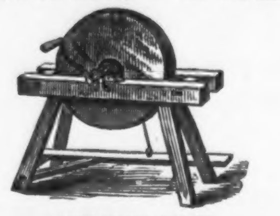
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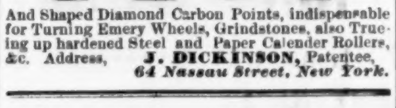

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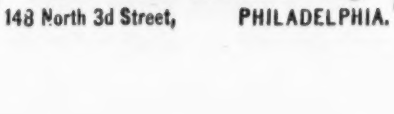
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Sifters.—Coal, Rice, &c....$12 00
Spading Forks.—M. & E....dis 25 %
Stone Pickers.—"Partridge," original....₩ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Parr's....7 5 per doz
Traps.—Oneida....dis 25 %
Blake's....dis 50 %
Vises.—K. P. & Co.'s Solid Box. Blacksmith....₩ ℔ 13c
Parker's Parallel....dis 10 %
Backus....dis 25 %
"Howards," Parallel....dis 20 %
Wardrobe Hooks.—Wire to drive....₩ gross $1 00
Weather Strips.—"Harmon's"....per doz $5, dis 10 %
Weights.—Window Weights....₩ ℔ 2c
Wedges—Axe....₩ doz 38c
Wire.—
Eureka, in spools, No. 28 to 40 assorted....₩ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black....₩ ft 5½c
Wrenches.—Genuine Wrenches, G. A. Coes..dis 40&5 %
Walton....dis 50 %
Wringers.—
Novelty and Universal } Tub No. 2 { ....Less than doz, $72 00
....2 doz or more, 70 00
Bench A....less than 2 doz $86 00; 2 doz or more $84 00
" B.... " " 94 00 " " 92 00
" C.... " " 110 00 " " 107 00
Eureka.... " " 60 00 " " 58 00
Withington, Cooley & Co.—
Hoes, Rakes, Forks, &c....dis 33⅓ %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz, 110 North Street, Boston, Importers and Commission Merchants.)
September 1, 1875.

Iron.—Best Refined Bar Iron....₩ ton $60 00
"Burden Best" " " .... " 95 00
Swedish Bar Iron....gold " 110 00
Norway Shapes....gold " 125 00
Norway Nail Rods....gold " 130 00
Sheet Iron, American....₩ ℔ 4½c
" " Galvanized.... " 9 c
" " Russian....gold " 13½c
Plate Iron, C. No. 1.... " 3½c
Iron Rails....₩ ton $50 00
Steel Rails.... " 77 50
Pig Iron, Foundry, No. 1 extra.... " 28 00
" " No. 2 extra.... " 25 00
" Gray Forge.... " 23 00
" Scotch.... " 30 00 @ 32 00
Wrought Scrap Iron.... " 31 00
Old Rails.... " 28 00

Steel.—	₩ ℔	German....₩ ℔	9½c
Eng. Tool, gold	15½c	Spring....	8 c
American Tool	14½c	Tire....	6 c
" Mach	9½c	Sleigh Shoe....	4½c
Bessemer....	7 c	Toe Calk....	7½c
Tin Plates.—₩ box gold		**Copper.**—	₩ ℔
I. C. Char. 10x14	$8·00	Ingot....	23½c
I. C. Coke 10x14	7 00	Bolt....	30c
Char. Roof. IC, 14x20,	7 50	Sheathing....	30c
Coke " IC, 14x20,	6 50	**Lead.**—	₩ ℔
METALS.		Pig....	7½c
Pig Tin.— ₩ ℔., gold		Sheet & Pipe....	8·55
Banca....	21c	**Zinc.**—Sheet..₩ ℔	10c
Straits....	19c	**Spelter**....₩ ℔	7½c
English....	19c	**Antimony**, gold ₩ ℔	12½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror....₩ doz, $7 75
Hudson's Rotary.... " 7 75
Axes.—Wm. Mann's, Red Warrior....₩ doz $11 50
Wm. Mann's, W. Stewart's.... " 11 00
" C Marshall.... " 10 50
" Handled.... " $5 extra
" Double Bitted.... " 2 50
H. L. B. & Co.'s, L. & Co.... " 11 50
" Pioneer.... " 12 00
" James & Co.... " 11 00
Hunt's.... " 12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles....dis 10 & 5 %
Common Axles (Pat. Lubricating), 1¼ inch and upward....₩ ℔. 6½c.
do. less than 1¼ inch.... " 7 c.
Bellows.—Best St. Louis make, 60c ₩ in. dis 30&2½ %
Bells.—Troy, Church, School and Farm Bells..₩ ℔ 44c
"Improved Amalgam Bronzed," 15 in., $3·00; 17 in., $4·00; 19 in., $6·00....net
Belting.—"Boston Belting Co.'s Rubber..dis 30&7½ %
"Bradford & Sharp's" Oak-Tanned Leather....dis 30 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire..dis 70&10 %
Arms, Bell & Co.'s Machine....dis 30&10 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint....dis 25&10 %
Broad Fast Joint....dis 3 &10 %
" Loose "....dis 45&10 %
Reversible....dis 40&10 %
" Japanned and Silver Tipped....dis 45&10 %
Loose Joint "Acorn"....dis 45&10 %
Wheeling Hinge Co.'s W't Fast Joint Nar....dis 30 %
" " " Broad....dis 35 %
" " " Loose Joint....dis 35 %
" " " Reversible....dis 35 %
" " " Table & B'k Flaps....30 %
Churns.—Julian, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50....dis 25 %
Cider Mills.
American Senior, $40·00; Am. Junior, $25·00....dis 20 %
Corn Knives.—Dunn Edge Tool Co.'s Clip....₩ doz 5 00
Seymour Mfg. Co.'s Solid Steel Back.... " 4 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers....dis 10 %
Hand Shellers....Special rates
Cotton Gins.—The Carver, 10 in. Saw, $4 a Saw..dis 15 %
12 in. Saw, $4·50 a Saw....dis 15 %
Crow Bars.—Steel Pointed....₩ ℔ 6½c
Drag Saw Machines.—
Culver's Iron Drag Saw....dis 10 %
Robinson's Patent Sweepstakes Drag Saw....dis 10

Fanning Mills.—Nash & Cutt's....dis 30 %
Feed Cutters.—Improved Burdick National....dis 30 %
Sanford No. 1, $10 75; No. 4, $8 00....net
Files.—Black Diamond, Mill....$5 00 £ currency.
" Bastard....5 00 £ currency.
" Taper....5 00 £ currency.
Forges.—Keystone Portable Forge Co.'s....dis 12½ %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks....dis 33⅓ %
" Handled Hoes....dis 33⅓ %
Garden Seed Drills and Wheel Hoes.—
Allen's Double Wheel Hoe....dis 5 %
" Planet Drill, Nos. 2 and 3....dis 15 %
" Combined Drill and Wheel Hoe....dis 15 %
Grinding Mills.—Challenge Feed Mills....dis 15 %
Sedgebeer's Nonpareil Mills....dis 15 %
Hammers.—Masons' Hammers....dis 20 %
Smiths' Hand....20 %
Handles.—No. 1 Fork, Hoe and Rake....dis 20 %
No. 2 Fork, Hoe and Rake....dis 40 %
Harrow Teeth.—1 inch iron....₩ ℔ 4½c
¾ and ⅞ inch iron.... " 5c
Barbed or Headed....½c extra
Hay and Cotton Presses.—
Dederick's Railroad....net list
" Perpetual....net list
Hay Knives.—
Dunn Edge Tool Co.'s....₩ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent)....₩ doz $13 50 net
Hinges.—
Wheeling Hinge Co.'s Strap & T....dis 33⅓&10 %
Horse Hay Fork.—Nellis' Harpoon....dis 25 %
Horse Nails.—National Patent Pointed....30c rates
National Patent Pointed, extra finished....40c rates
Horse Powers.—Pitts or Carey's Patent....dis 20 %
Wheeler's Railway....dis 25 %
Sandwich Lever....dis 20 %
Horse Rasps.—Heller Bros....dis 45 %
"Black Diamond"....60 00 to the £ currency
Horse Shoes.—
Rhode Island (Perkin's Pattern)....₩ keg $5 50
" Mule.... " 6 00
" Trotting Shoes.... " 8 00
Tredegar Horse....per keg $5 50
" Mule....per keg 6 50
Hose.—
Boston Belting Co.'s Rubber Medium Sizes, dis 30&10 %
" Small Sizes, Hydrant....dis 40 %
Ice Tools.—W. T. Wood & Co.'s Saws....new list net
W. T. Wood & Co.'s Chest Hatchets....new list net
" Axes....new list net
" Loading Tongs....new list net
" Medium, Small and Family Tongs....new list net
" Chisels, Hooks and Grapples....new list net
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks....₩ doz $13 00 @ 13 50
" Grub Hoes, oval eye....10 00 @ 11 50
Money Drawers.—
Pierpont & Co.'s Excelsior....per doz $40 00 net
Nails.—Wheeling....$3 25 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure....dis 20 %
" No. 3 Plain....dis 40 %
" Round and Square....dis 10&10 %
Picks.—Klein, Logan & Co's Railroad and Clay....₩ doz $10 50 @ 11 00
Klein, Logan & Co.'s Coal....7 45 @ 8 00
" Poll....12 00 @ 12 50
" Stone....14 00 @ 14 50
" Tamping....12 00 @ 12 50
" Miners' Drifting....10 25 @ 12 50
Plows.—Avery's Cast and Steel....dis 20 %
Collins Cast Cast Steel....new list net
Pekin Steel....new list net
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz $27; No. 2, $30; No. 3, $32....dis 5&5
Pulleys.—5 inch....per doz $4 25 net
4 inch....per doz $3 75 net
Nellis' Patent....new list net
Pumps.—
St. Louis, Farm, Patent Metal Lined....new list dis 50 %
Rakes.—Paddock's Premium Sulky....$38 00 ea.
St. Louis Revolving 14 tooth....4 65 ea.
" 16 "....4 90 net
Hand Hay Rake....
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives....dis 40 %
" Sections....dis 40 %
Road Scrapers.—Steel....dis 35 %
Cast Iron....dis 20 %
Sad Irons.—Monitor Brand, Silver Polished....₩ ℔ 4½c
Sash Weights.—Standard solid Eyes....₩ ℔ 2½c
Saws.—Curtis & Co....dis 50 %
Scythes.—Dunn Edge Tool Co.'s....new list dis 20&5 %
Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00
Extra Indian Pond....7 50
Premium....10 50
Diamond Grit....10 50
Shovels and Spades.—Myers & Armor....dis 15 %
O. Ames & Sons....dis 20 %
Grain Scoops, Pat. Corrugated Straps M. & A. dis 15 %
" " T. Rowland's dis 15 %
" " O. Ames & Son dis 12½ %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished....₩ ℔ 15c
Solid Cast Steel.... " 15c
Snaths and Cradles.—Seymour Mfg. Co.'s....dis 30 %
Sorghum Machinery.—Bell Cane Mills....dis 30 %
Scantlin's Seamless Evaporators....dis 25 %
Springs.—Cleveland Spring Co.—
Carriage and Express....dis 12½ %
Blue Seat Springs....dis 25 %
Vises.—Solid Box....₩ ℔ 15c
Wilson Mfg. Co.'s....dis 15 %
Wheelbarrows.—Railroad & Garden....new list net
Wrenches.—Coes' Genuine....dis 33⅓ %
Coes' Pattern....dis 50 %
Wagons.—Whitewater Farm Wagons—
Thimble Skein....No. 3, $78; 3¼, $80; 3½, $81
Iron Axle....No. 1½, $80; 1¾, $83; 2, $90

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC, 10x14, Best Char. ₩	$10 00	IX, 14x20, Roofing....	$11 50
IX, 10x14, "	12 50	IC, 20x28, "	18 00
IC, 12x12, "	10 50	IX, 20x28, "	23 00
IX, 12x12, "	12 50	IC, 10x14, Coke....	9 00
IC, 14x20, "	10 00	IC, 14x20, "	9 00
IX, 14x20, "	13 00	IC, 10x20, "	9 50
IC, 14x20, Roofing	9 00		

Usual difference for odd sizes.

Block Tin.
Large Pigs....25c | Bars....27c
Small " L & F....26c
Sheet Zinc.
Casks....₩ ℔ 10½c | Sheet....₩ ℔ 11c
Solder.
No. 1, Refined, in bars or plate....16c
No. 2, " " 14c
Pig Lead....7¼c
Sheet Copper.—14 to 100 lbs. Sheets 30 oz. and upwards....32c
10 to 12 lbs.... " and 32 oz....33c
6 to 9 lbs....35c
Tinned, 14 and 16 oz. 14x48....45c
Planished, 14 and 16 oz. 14x48....45c
" No. 3 and 9....37c
Copper Bottoms....37c

Sheet Iron.

	Com'n.	Sm'th.	Char'l.	Jun'a.
No. 16 to 20	4½c	4½c	6½c	7½c
No. 22 to 24	4¾c	4¾c	6¾c	7¾c
No. 26	4¾c	5c	6¾c	8c
No. 27	5c	5½c	7c	8½c

Galvanized Iron....dis 30 %
Iron Rivets....dis 25 %
Iron Wire....dis 25 %
Coppered Pail Bail Wire....dis 25 %
Copper Rivets and Burs....dis 25 %
Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12....per lb. 17c
Stained—No. 9, 10, 11, 12....per lb. 16c
Tare 25 to Bdle. For less than 1 Bdle. add lc ₩ lb.
Retinned Stamped Ware....dis 25 %

CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)
September 10, 1875.

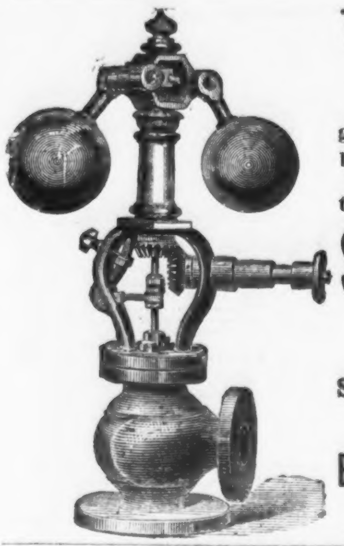
Tin Plate.—

10x14, IC, Ch'l, Best	$13 00	14x20, IX, Ch'l, Best	$13 00	
10x14, IX, "	15 50	14x20, IXX, "	15 00	
10x14, IXX, "	17 50	14x20, IXXX, "	17 00	
12x12, IC, "	13 00	DX, "	18 00	
12x12, IX, "	15 00	DXX, "	20 00	
14x14, IC, "	10 70	DXXX, "	22 00	
Roofing, IC, Charcoal, Best			9 00	
Roofing, IX, Charcoal "			11 00	
20x28, IC, Charcoal Roofing, Com			18 00	
20x28, IX, " Good			18 00	
20x28, IC, " Best			19 00	
20x28, IX, " "			23 00	
10x14, IC, Coke Plates			9 00	
14x20, IC, "			9 00 to 9 50	
10x20, IC, "			9 50	

Block Tin.—
Large Pigs....27c | Bars....29c
Small " 28c
Zinc.—Sheet, 500 to 1000 lb. Casks....10c
Loose Sheets....10½c
Slab Zinc or Spelter....7½c
Copper.—Bottoms....36c
Sheathing....34c
Planished....45c
" Boiler lengths....
Ingot....25c
Bolt....30c
Braziers' Sheets.—
20x60, 6 & 7 lbs....₩ ℔ 38c | 30x60, 10 & 12 lbs....₩ ℔ 35c
20x60, 8 & 9 lbs.... " 36c | Same, 15 to 100 lbs.... " 34c
Solder.—F. S. & Co.'s make.
Best Fine....20c
No. 1....18c
Roofing....17c
Braziers' or Spelter Solder....20c
Antimony....18c
Babbitt Metal.—F. S. & Co.'s
No. 1....14c
Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24	4¾c	5¼c	7 c	8 c
25 & 26	5c	5½c	7 c	8 c
27	5¼c	5¾c	7½c	8½c

Galvanized Iron.—
No. 16 to 20....14c | No. 27....16c
21 to 24....14c | 28....
25 & 26....15c |
Russia Iron.—
Perfect....17c | No. 1 Stained....16c
American Russia.—In sheets, 1c. higher.
A....16c | B....15c
Lead.—
Pig....7½c | Lead Pipe, in full coils....9½c
Bar....8½c | Lead Pipe, when cut....9½c
 | Sheet Lead....9½c
Wire—Bright....dis 35 %
Coppered....dis 30 %



TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

Shive Governor Co

BETHLEHEM, PA.

ALSO,

SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR,

AND

Buoy's Patent Counter Scale

No Nest of Weights.

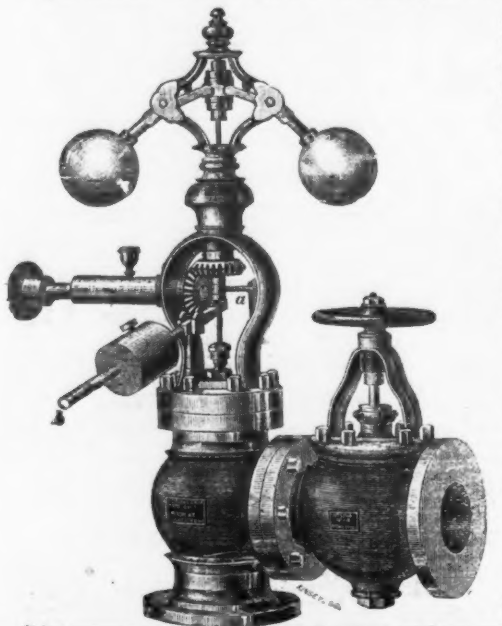
Circulars sent free

February 10, 1875. REDUCED PRICE LIST OF THE

JUDSON PATENT IMPROVED GOVERNORS,

☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.



Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
½	18·00	20·00	17·00	..	..
¾	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	32·00	27·00	2·25	6·60
1½	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00	No Larger Portable made than 2½ in.	3·75	19·00
3	62·00	70·00		4·25	22·00
3½	71·00	80·00		4·50	27·00
4	81·00	92·00		5·00	32·00
4½	91·00	103·00		5·50	37·00
5	102·00	114·00		6·00	42·00
5½	116·00	129·00		6·50	48·00
6	134·00	148·00		7·00	55·00
7	160·00	176·00		8·00	69·00
8	199·00	219·00		9·00	83·00
9	230·00	255·00		10·00	..

No Charge for Boxing & Cartage.

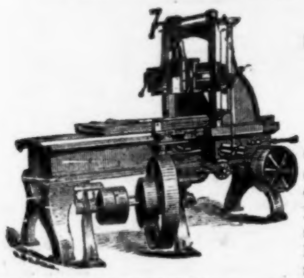
It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Pratt & Whitney Co.,

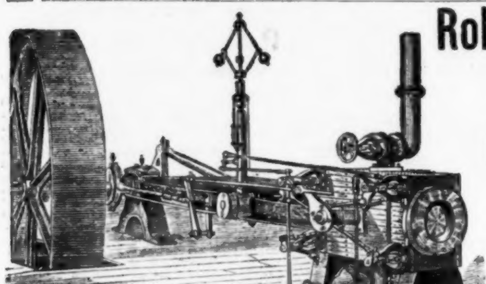
Hartford, Conn.,

Have constantly on hand and making



Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



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CHESTER, PA.

Corliss Engine BUILDERS

AND

Boiler Makers.

THORNE, DeHAVEN & CO.

21st Street, above Market, PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

BLAKE'S PATENT STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength

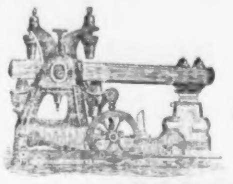
For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c. For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

BRADLEY'S CUSHIONED HAMMER



Has Larger Capacity,

Is More Durable, takes up Less Room, does More and Better Work with less expense for Power and Repairs than any other Hammer in use.

GUARANTEED as RECOMMENDED.

Address, BRADLEY MANUFACTURING CO., Syracuse, N. Y.

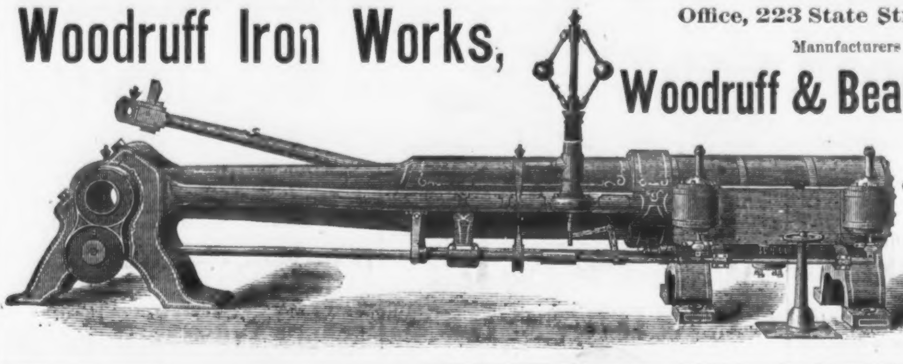
Woodruff Iron Works,

Office, 223 State Street, Hartford, Conn.

Manufacturers of the Celebrated

Woodruff & Beach Steam Engine,

With recent valuable Improvements.



Steam Boilers

Constantly on hand and made to order any size or style. Special attention given to the manufacture of

MILL WORK

And all kinds of Machinery.

CASTINGS

Of any size or style. Direct all letters to The Woodruff Iron Works, Hartford, Conn., as the Woodruff & Beach Iron Works and firm of Woodruff & Beach are both dissolved.

Knowles Patent Steam Pumps

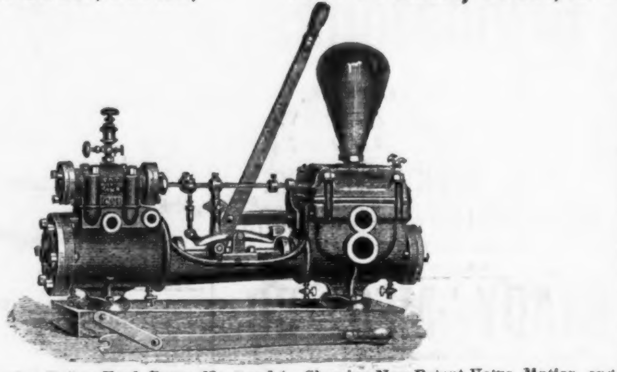
MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston, 92 & 94 Liberty Street, N. Y.



Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS, a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.

Whittier Machine Co.,

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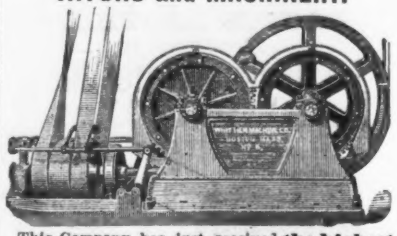
Manufacturers of

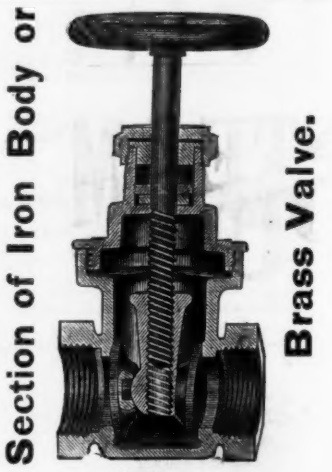
STEAM ENGINES, BOILERS, ELEVATORS and MACHINERY.



This Company has just received **the highest award, a Gold Medal, for Safety Elevators**, from the Massachusetts Charitable Mechanics Association.

CHARLES WHITTIER, Prest. JAMES STURGIS Treas.

Section of Iron Body or Brass Valve.



The EDDY VALVE

Made by the

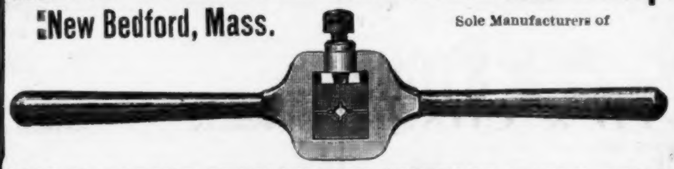
MOHAWK & HUDSON MFG. CO.,

Waterford, N. Y.

Four miles from Troy, N. Y., by steam or horse cars.

Morse Twist Drill and Machine Company,

New Bedford, Mass. Sole Manufacturers of



MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.

Beach's Patent Self-Centering Chuck.

Also Manufacture Patent Taps and Dies, Patent Screw Plates, Patent Tap Wrenches, Pipe Taps and Pipe Reamers, Gas Dies.

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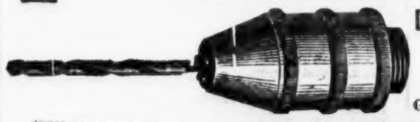
All Tools exact to Whitworth's Standard Gauge.



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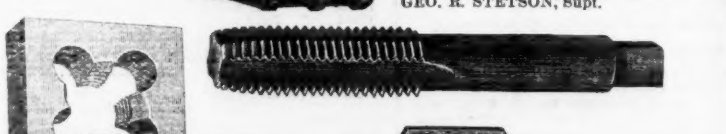

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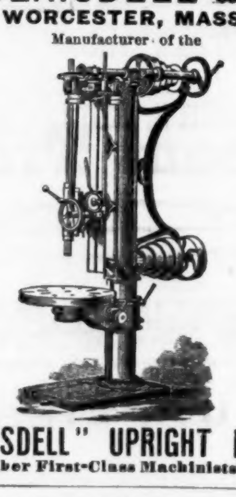

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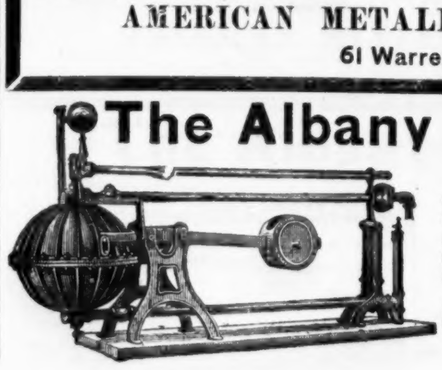

This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

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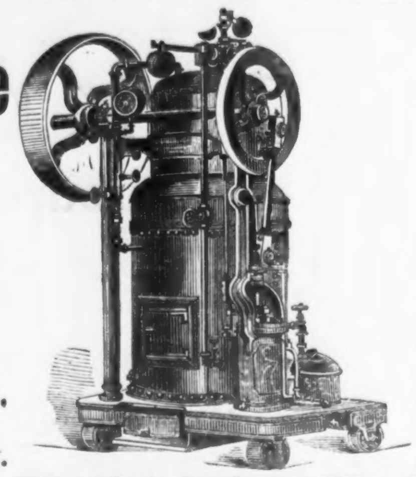

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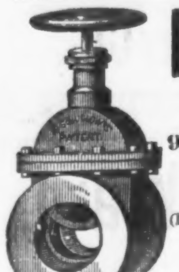

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From twelve (12) to forty-eight (48) inches swing:
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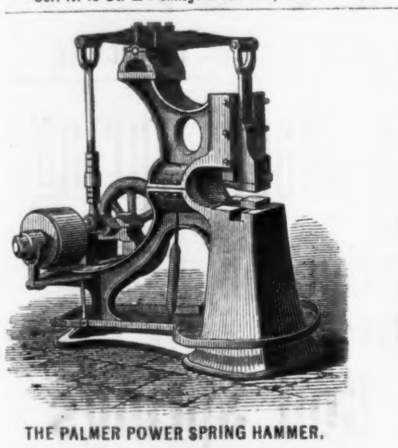

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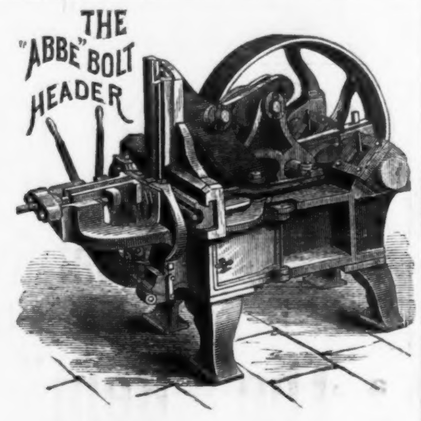

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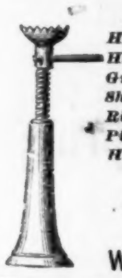

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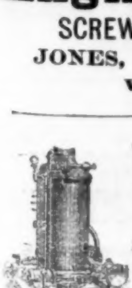

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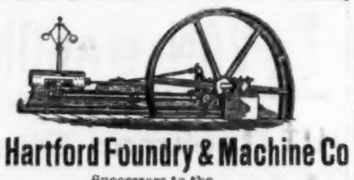

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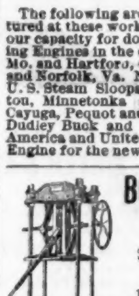

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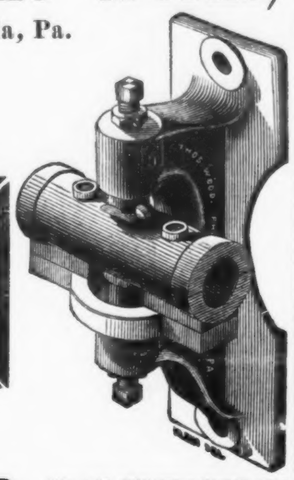

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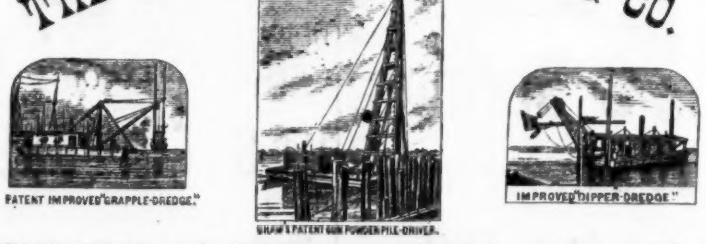

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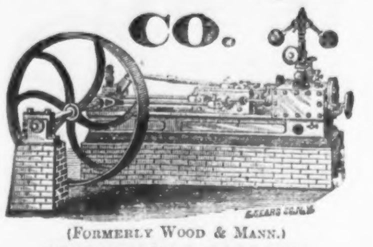

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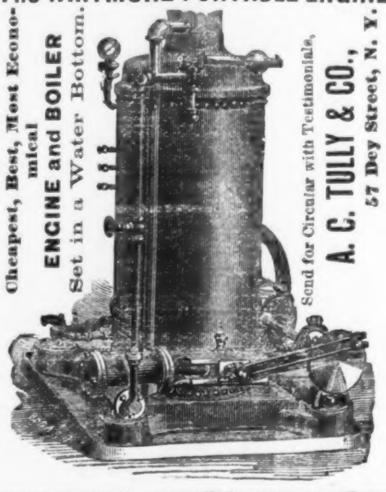

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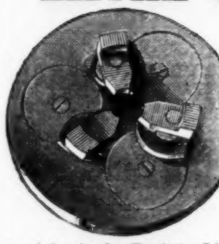

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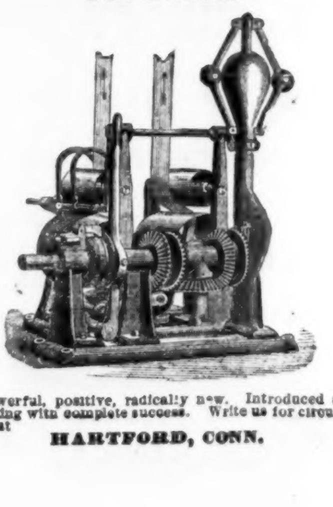

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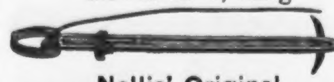

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